November 9, 2006

MEMORANDUM **UTAH DEPARTMENT OF TRANSPORTATION**

TO: Jim McMinimee, P.E., Chairman

FROM: Barry Axelrod
Recorder, Standards Committee

Barry Axelrod
Digitally signed by Barry Axelrod
DN: cn=Barry Axelrod, c=US, l=Salt Lake City, st=UT, ou=http://www.usertrust.com/cps, email=baxelrod@utah.gov
Date: 2006.11.09 11:36:39 -07'00'

SUBJECT: Standards Committee Meeting Minutes and Next Meeting

The next meeting has been scheduled for Thursday, November 30, 2006 at 8:00 a.m., in the main 1st floor conference room of the Rampton Complex. The October 26 meeting was canceled.

Item		Remarks	Sponsor
1.	Minutes of August 31, 2006	For approval	Barry Axelrod
2.	Supplemental Specification 02844, Concrete Barrier and Standard Drawing BA 3C, Precast Constant Slope Barrier (new)	For approval	Steve Anderson
3.	Supplemental Specifications on General Provisions. See listing.	For approval	Karl Verhaeren
4.	Supplemental 02056, Embankment, Borrow, and Backfill. See listing.	For approval	Karl Verhaeren
5.	Supplemental Specification 02892, Traffic Signal and Standard Drawing SL 9, Pedestrian Signal Assembly	For approval	Scott Jones
6.	Standard Drawings, BA 3 Series Drawings. See listing.	For approval	Glenn Schulte
7.	Standard Drawings, BA 4 Series Drawings. See listing.	For approval	Glenn Schulte
8.	Standard Drawings, CC Series Drawings. See listing.	For approval	Glenn Schulte
9.	Review of Assignment/Action Log	For review	Jim McMinimee
10.	Meeting Improvements (on-going agenda item)	For discussion	Jim McMinimee
11.	Other Business	For discussion	Jim McMinimee

JCM/ba
Attachments

cc:

Cory Pope Director, Region One	Stan Burns Engineering Services	Richard Miller Standards
Randy Park Director, Region Two	Boyd Wheeler Bridge Design	Barry Axelrod Standards
David Nazare Director, Region Three	Karl Verhaeren Construction	Patti Charles Standards
Dal Hawks Director, Region Four	Tim Biel Materials	Shana Lindsey Research
	Richard Clarke Maintenance	Tracy Conti Operations
	Robert Hull Traffic and Safety	Carlos Machado and Todd Emery FHWA
	Troy Peterson Traffic Operations Control	Mont Wilson AGC
	Rex Harris Region 1, Preconstruction	Tyler Yorgason ACEC

Agenda Listing

Item 3:
Supplemental Specifications

00555	Prosecution and Progress
00570	Definitions
00725	Scope of Work
00727	Control of Work
01282	Payment

Item 4:
Supplemental Specification

02056	Embankment, Borrow, and Backfill. (new title and requirements) Eliminates Sections 02056 (Common Fill), 02061 (Select Aggregate), 02324 (Compaction), 02330 (Embankment), and 02332 (Embankment for Bridge)

Item 6:
Standard Drawings

BA 3A1	Cast In Place Constant Slope Barrier
BA 3A2	Cast In Place Constant Slope Barrier
BA 3B	Precast Constant Slope Transition Section For Crash Cushion and W-Beam Guardrail

Item 7:
Standard Drawings

BA-4B	W-Beam Guardrail Transition
BA-4D	W-Beam Guardrail Anchor Type I
BA-4E	W-Beam Guardrail Installatins
BA 4L	W-Beam Guardrail Curve Details
BA-4P	W-Beam Guardrail With Precast Barrier for Span > 25 ft
BA-4Q1	W-Beam Guardrail With Modified Curb And/Or Curb and Gutter
BA-4Q2	W-Beam Guardrail With Curb and Gutter ≥ 5 inches

Item 8:

CC 8A	Grading and Installation Details Crash Cushion Type G
CC 8B	Grading and Installation Details for “3R” Projects Crash Cushion Type G
CC 9A	Grading and Installation Details Crash Cushion Type H

August 31, 2006

A regular meeting of the Standards Committee convened at 8:00 am, Thursday, August 31, 2006, in the 1st floor conference room of the Rampton Complex.

Members Present:

Darrell Giannonatti	Project Development (for Jim McMinimee)	Chairman
Richard Miller	Standards and Specifications	Secretary
Barry Axelrod	Standards and Specifications	Recorder
Randy Park	Region 2	Member
Stan Burns	Engineering Services	Member
Karl Verhaeren	Construction	Member
Richard Clarke	Maintenance	Member
Larry Montoya	Traffic and Safety (for Robert Hull)	Member
Tim Biel	Materials	Member
Troy Peterson	TOC	Member
Rex Harris	Region 1, Preconstruction	Member
Todd Emery	FHWA	Advisory Member
Mont Wilson	AGC	Advisory Member
Tyler Yorgason	ACEC	Advisory Member

Members Absent:

Jim McMinimee	Project Development	Chairman
Robert Hull	Traffic and Safety	Member
Boyd Wheeler	Bridge Design	Member
Carlos Machado	FHWA	Advisory Member

Staff:

Barry Axelrod	Standards and Specifications
Patti Charles	Standards and Specifications
Shana Lindsey	Research
Steve Anderson	Preconstruction

Visitors:
None

Standards Committee Meeting

Minutes of the August 31, 2006 meeting:

1. Minutes of June 29, 2006 meeting were approved as modified.

   Mont asked about the dimple marks on the right of way marker from the June 29, 2006, agenda item 2 discussion. He asked if that had been resolved.

   Discussion points were:

   - Darrell thought it had not been resolved. Barry said he did not remember any open items from the discussion of the right of way marker agenda item. Barry said the Supplemental Specification and Standard Drawing change were approved with no open items that needed to be resolved. Barry referred to page 4 and 5 of the agenda package for the discussion of this item. Barry quoted Jim Baird's comments at the meeting stating "the mark or dimple is needed so in the future an instrument can be set up over the survey point. He said because the specification did not call for the mark it was being left off." Barry said this was Jim Baird's explanation of the change to the specification.

   - Barry said there was no other information or anything left open and that the motion was approved for the item as discussed. There was no modification indicated in the motion or any action item. Barry asked Mont if something was missed. Mont asked if the dimple was to be put on the marker or not, within a hundredth. Barry said that is what is in the Supplemental. Mont said to go on if it is covered. Richard commented that Barry could check to make sure it was addressed. Barry looked at the latest GW 6 drawing and said it did not call for a mark or dimple, but he did not have a copy of the Supplemental Specification to check.

   - Darrell asked Barry to check into the Supplemental.

   - Richard asked if anything needed to be brought back to the Committee. Comments were no. Randy said there are two questions. Is the dimple or mark required? Being that it is, Randy asked who places the mark. Comment was the surveyor. Karl said if it is the Specification then the Contractor is responsible.

   - Randy said to check which surveyor is responsible.

   - There was no further discussion.

   Action Item: Barry to check Supplemental Specification 02896M for wording on the mark or dimple and who places the mark or dimple.

Motion: Randy Park made a motion to accept the minutes as discussed. Seconded by Richard Clarke. Passed unanimously.

Post meeting comment: The Supplemental covers this as shown below. There is no indication on the Standard Drawing for a mark or dimple, but it is covered in the Specification. The Supplemental for 02896M states:

Delete Article 3.1, paragraph A and replace with the following:

A. Place Right-of-Way Markers in accordance with GW series Standard Drawings. Stamp onto each Right-of-Way Marker:
   1. Right-of-Way marker number
   2. Exact control point mark location to within 0.01 feet (center punch or "dimple")

2. Supplemental Specification 02844, Concrete Barrier and Standard Drawing BA 3C, Precast Constant Slope Barrier (Agenda Item 2) - Presented by Steve Anderson.

Steve said he was asked to look into this around the 2004 time frame. It was brought to the Standards Committee at that time but further action was not approved so the item was dropped. Steve said they did some Value Engineering studies in Region 1 and found they were using Precast Constant Slope Barrier that had not been tested yet.

Steve went on to show the information he received from the Texas DOT where they use the "Texas cross." Steve said this is a new way that was tested through the Texas Transportation Institute using the Jersey shaped barrier. He said the tests were completed up through level 3, adding that 10 and 30 foot sections were tested. Any size in between can be used. Steve said the deflection is small and that Texas recommended we use the 30 foot section.

Steve said he had asked Glenn Schulte to talk to Maintenance about the equipment needed to lift the 30 foot sections. Steve went on to discuss how the sections are moved. Steve proposed adoption of the new barrier.

Steve said this was coordinated with all stakeholders in accordance with the Standards Committee process. Comments are shown in the submittal sheet.

Discussion points were:

- Randy said if we require 30 foot sections will we allow other sizes. Steve said that is what needs to be decided. Steve said the larger sections would be more economical because of the cost of the connections. A smaller section would require more connections and therefore cost more.

- Discussion continued on general length and cost issues.

- Darrell asked Randy for his input from a region standpoint. Randy said we need to pick a standard length and go with that.

- Steve again said that Glenn was going to get with Maintenance. Richard Clarke said he talked to them but he did not think the length came up as an issue. He said the main discussion was the "Texas cross" and that everyone was good with it. Steve said he did not know what size equipment each of the regions had. Steve said the contractor could decide on the length and provide the equipment as an option. Richard said they want the ability to do this in-house as well.

- Darrell asked Mont if he saw any issues on the Standard Drawing. Mont said he did not, but brought up a cost point of view. He said the Contractor installation cost may go up. He said they are use to hauling two 20 foot sticks on a flatbed.

- The issue is what we want for a Department wide Standard for the length.

- Mont discussed loader capability in lifting the different size sections.

- Someone commented that the 15 footers could be handled with current Department equipment and we would be more efficient hauling them on the 40 foot flat bed.

- Randy thought Richard Clarke needed to take this back to the Maintenance people to determine a length. Darrell asked Richard if that needed to come back to this group or just allow the latitude to adjust it. Richard said it would be either a 15 or 20 foot section. Randy said anything other than that needed to come back.

- Karl said in addition to lifting weight we need to look at what can be hauled on a flat bed.

- Discussion continued with the review of the specification and drawing.

- In response to a comment by Richard Miller, Steve said he already had Boyd's comments. Richard said the comments are minor structural comments.

- In response to a question from Darrell, Mont said he did not have a problem with the connection part of the barrier.

- Richard Clarke asked about odd sizes being needed to fill in gaps. Randy said that was why he liked the 20 foot section in that it would be the same size as the current Jersey barrier.

- Darrell asked Steve if suppliers had a chance to comment during the review process. Steve said it was sent out to Eagle Precast but they did not comment.

- Mont asked about sealant along the part of the barrier that contacts the ground and about a neoprene patch put between the sections. He said he did not see either on the drawing. Steve said the patch is on the old drawings but Texas did not use it on this system so it was not included on our drawing. Darrell said he is assuming we still require sealant. He asked if that should be shown in the detail drawing so the Contractor knows what to bid. Richard Miller commented that we got rid of the sealant a while ago and now just allow for drainage under the barrier.

- Steve commented that on the typical section detail it shows a one inch layer of asphalt to hold the barrier in place laterally. He asked if that would not also seal the barrier. Instead of having to use a Change Order Darrell said to put the sealant in the detail.

- Darrell asked for an action item to determine if we want sealant or not, adding it to the drawing if that is determined to be wanted. Randy said this is a Maintenance issue and if they want it or not that is fine. Richard Clarke said he would come back and lobby for it if they decide the sealant is wanted but for now let's decide not to do it. Darrell said it did not have to come back to the group but could just be put in.

- Mont said to look at it on a higher level, asking is this system (the barrier) better than the one we are using now. Someone commented that this is just an alternative to cast in place. Steve said the regions really seem like it and it is something they want to use. Region 1 is already using this type. Darrell said from what he has heard it is time for the Department to add this type as an alternative. Randy added that this type also helps when doing overlays and staying within Standards.

- Darrell asked if there was a motion. Barry said he had some questions first. Barry commented about the open action items as a result of this discussion including determining the size with respect to the approval and publication process. Barry said if approved and unless the open items are resolved in the next seven days nothing will get published. Barry said the Supplemental Specification can not be published without the drawing and if the drawing issues are not resolved until the next meeting then the drawing can not be published. Barry said all the issues need to be resolved now or within a week or neither can be approved for two months. Barry added that he can not see how we will be ready to publish within 10 days with all the open issues.

- Richard commented on this and the overall process. He said this Supplemental and drawing went out to several people within the Department including Maintenance and Construction so to get these kinds of comments makes him ask why we even go through the effort to complete the submittal sheet process. Richard said he wonders where the process is broke or not working, but that should not be confused with what we are trying to do with this item. He said the purpose of the form was to get all the inputs up front and not get those types of inputs now when it should have been done weeks ago. Richard said other than the size determination too many other issues were brought up.

- There was a question as to whether a motion to table the item was needed. Barry said it was not need. The item would just be brought back next time.

- Darrell asked when everything needed to be ready by for the 2008 issue. Barry said everything needs to be approved by October 2007 for issue in January 2008. Barry said everything really needs to be to the Standards Committee by August 2007 so if something like today occurs it still can be approved at the following meeting and meet the deadline. Barry said that will be covered with all the review teams as the process progresses and that it is already built into the schedule.

- This item will be brought back to the next meeting.

Action Item: The issues discussed are to be resolved prior to bringing the item back for approval.

3. Supplemental Specification 02373, RIPRAP (Agenda Item 3) - Presented by Tim Biel.

Tim said a test is being removed that is no longer appropriate.

Discussion points were:

- There was no significant discussion.

Motion: Richard Clarke made a motion to approve Supplemental Specification 02373 as presented. Seconded by Randy Park. Passed unanimously.

4. Supplemental Specification 02741M, Hot Mix Asphalt (Agenda Item 4) - Presented by Tim Biel.

Tim said the Department Special Provision has been in effect for a year or so. He said they are replacing the flats and elongates test with the flakiness index. Editorial updates were also made. Tim discussed the tests and their effectiveness.

Discussion points were:

- Darrell asked if this had been through the Paving Council. Tim said it had.

- Tim pointed out a typo in the footer. Barry said he would correct it.

- There was no other significant discussion.

Motion: Stan Burns made a motion to approve Supplemental Specification 002741M as discussed and modified. Seconded by Troy Peterson. Passed unanimously.

5. Supplemental Specification 02765, Pavement Marking Paint (Agenda Item 5) – Presented by Tim Biel.

The item was pulled prior to the meeting but there was still some discussion.

Discussion points were:

- Karl asked when this item would be brought back. Tim said he did not know. He said Degen Lewis in Materials still had to meet with Vincent Liu in Maintenance to resolve issues. Karl said until this is resolved the Standard will not go into any contract, being replaced by the Department Special Provision. Karl said it doesn't matter in that the Special Provision has been in use for two years. Tim said he was asked by three people not to use this recommended version for the Supplemental Specification.

- Richard Clarke said they need to do the review. He said they should be ready for the October meeting.

- Randy asked about the issue that needs to be resolved. Karl again said this version has been used for two years. Tim said Vincent believes a formulation he has is better than the one used by Materials. Tim added that two of the three suppliers said they can not meet the current formulation. Tim discussed the details of the formulation. Comments indicated there may be other issues that need to be resolved.

- Barry asked if the Department Special Provision is being used this way even though the issues have existed for a while. Tim said yes, for the last year. Tim said this is a construction specification so when maintenance makes a purchase they use their version. Shana said we are trying to combine the two and have only one specification.

- Karl said his point is that since the 2005 version of the Standard Specifications was printed the Standard never went into a project and that the Department Special Provision has been in effect since 2004.

- Randy asked based on Richard's earlier comments did the process fail for having this all coordinated and done by today. Tim said no one said a word on the issues for a year and a half until it was submitted for the agenda.

- Karl said when you look at how we deal with contracts and Specifications including Special Provisions the Standards Committee could take action to approve this and make it a Standard with no change to the end result.

- Suspense dates for the 2008 book were again discussed. Barry said the current goal is to get as many Department Special Provisions approved as Standards separate from the 2008 process. This addresses a separate issue with the Regions having problems with Department Special Provisions. Comments indicated the Committee thought the changes to this item would come through the related QIT.

- There was no other discussion.

Action Item: Supplemental Specification 02765 to be updated to meet Materials and Maintenance requirements.

6. Supplemental Specification 02785, Chip Seal Coat (Agenda Item 6) – Presented by Tim Biel.

Tim said this item has been a Department Special Provision for at least one season if not longer and is being submitted for approval as a Standard.

Discussion points were:

- Barry said a lot of the changes seen in the printed copy are editorial changes from the Standards Section's review of the format and wording. Barry pointed out they adjusted many of the ranges in the tables so all values were included.

- There was some discussion on high-float requirements. There were no issues related to this that impacted approval.

Motion: Randy Park made a motion to approve Supplemental Specification 02785 as presented. Seconded by Larry Montoya. Passed unanimously.

7. Supplemental Specification 02969, Optional Use of Reclaimed Asphalt Pavement (Agenda Item 7) – Presented by Tim Biel.

Tim said the same applies here as the last one, it a Department Special Provision being proposed as a Standard. Tim covered the changes they made to the Special Provision. He said this particular Special Provision has been out for two or three years.

Discussion points were:

- Troy asked about the "AMRL accredited laboratory" wording on the last page of the section. Tim said that needed to be changed. It will now read "UDOT qualified" in all locations in this section.

- Barry asked Tim to make that change when he cleans up the strikeout text for the final version. Tim asked if he should clean up the other approvals as well. Barry said yes. By doing that the owner can check the final text to make sure all additions and deletions were done correctly. Barry said if they create the final version they will just send it back to the owner for final review anyway. Barry said this is their preferred process for all changes.

- There was no other discussion.

Motion: Richard Clarke made a motion to approve Supplemental Specification 02969 as discussed and modified. Seconded by Stan Burns. Passed unanimously.

8. Schedule for 2008 Issue of New Standards (Agenda Item 8) – Presented by Barry Axelrod.

Barry said they are on schedule with the kick off at 11:00 today. Barry said they did a pre-kick off for the CET meeting in Region 2 on August 24. He said there were over 50 people at the meeting. The presentation went over really well with good comments received.

Barry said the main goal right now is to get the teams identified in September working so changes can be brought incrementally to this Committee throughout the next year. He said the other option is to bring everything to the Committee in one meeting for approval, but that would be overwhelming. Barry said a decision would still have to be made as to whether each approved change is to be held for the 2008 version or published as a change to the current version. He said if approved for the current version the change automatically goes into the 2008 version. The teams would make the decision on when each recommended changes goes into effect. The processing would be handled within the Standards Section.

Barry said as discussed earlier the deadline is October 2007 if the book and related items are going to be ready for issue in January 2008. He said the publisher needs time to put everything together and get the books printed. Barry said there is no way everything can be ready for a January issue with a final deadline past October of the previous year.

Barry said their main goal is that no one comes to them in January, February, or March, just after the new version is published and say they did not know about the change. Why didn't I know and get the chance to put in my inputs? That is not acceptable so hopefully with the kick off and all the advertising now and throughout 2007 that will not happen. Barry said that did happen with the last version in 2005. Barry said how the breakdown in communications came about does not matter; we just do not want it to happen again. Barry said he hopes the changes throughout 2008 will even be less. Barry said that is their goal and the direction they are moving.

Discussion points were:

- Stan asked about the teams and who the champion of each group will be. Barry said they are looking at three groups, as shown in the schedule, to work on the changes. Barry said a few names have already been submitted, but that they still need each Standards Committee member to decide who will represent their particular area. Barry said once they get all the names they will look at team composition. As for the champion, Barry said he would be at all the meeting along with Patti. Barry said the goal is to lead the teams or at least give them direction if they go off into separate subcommittee groups. Barry said Lynn Bernhard in Maintenance is already working as a sub-group on the FG series Standard Drawings. Barry said the Standards Section will provide the needed guidance.

- Richard said there will be three distinct teams. Barry added that FHWA is listed with all three teams because they have to approve all Standards used on Federal Aid projects. This way they are involved in the process from the beginning so approval by FHWA is not delayed and can be done similar to all regular changes in accordance with the Standards Committee policy. Todd asked if this process is working for their approval. Barry said it is working and that he has not seen any problems with the current FHWA approval process.

- Todd said they would try to be at the kick off and that he would provide names for the team listing.

- There was no other discussion.

9. Review of Assignment/Action Log (Agenda Item 9)

Darrell asked Richard Miller to comment on outstanding assignments. He said they are working with Robert Hull and Traffic and Safety to complete their open items.

Barry said he can update the due dates to the next meeting.

- Item 1, Rumble Strips. Richard said that Steve Anderson was given the assignment to update the drawings for this item.

- Item 2, Three-Legged/ Four-Legged Intersection. Richard said that Steve Anderson was also given the assignment to work on this item.

- Item 3, Supplemental Specification 00555M. Barry said there is no change on this item and that it is still open with no target date. Karl asked about this one. Richard said this was one Jim wanted to work with Tracy Conti on because there are so many unresolved issues. Karl commented that this dealt with traffic control issues and has been on the action log for quite a while.

- Item 4, Review of Standard Sheets 1B and 1C, Index. Barry said with no drawings approved at this meeting they will put together a Standard Drawing book over the next several weeks and do away with Standard Sheets 1B and 1C. The hard copy book will then be published with changes handled similar to Supplemental Specifications. Barry said all files and procedures will be updated.

- The status report as handed out at the meeting follows:

Action Item Update for August 31, 2006 Standards Committee Meeting
(As of August 15, 2006)

Item 1, Rumble Strips: Item is past due. Policy already published. No coordination by the Standards Committee. No other information received in response to request. This is the same information as listed for the June 2006 meeting.

Item 2, New Drawing of Three-legged and Four-Legged Intersection: Item wa past due from Traffic and Safety. No information received in response to request from Traffic and Safety. The Standards Section will be putting a drawing together for the October 2006 meeting.

Item 3, Supplemental Specification 00555M, Prosecution and Progress, Limits of Operation: Due date changed at February 2006 meeting to open. No target date. No information received in response to request. Information from the June 2006 Standards Committee discussion indicated this item is on hold. Item to be kept open for one more meeting cycle.

Item 4, Review of Standard Sheets 1B and 1C, Index. A meeting was held to discuss the need for these sheets. Attendees: Darrell Giannonatti, Karl Verhaeren, Richard Miller, and Barry Axelrod. Decision was that the sheets are no longer needed. A listing of all Standard Drawings with approval date to be included in all Project Table of Contents files. The check marks were eliminated. All Standard Drawings apply on all projects so checking off applicable ones is not needed on projects. A hard copy book will be published for with all Standard Drawings and an effective date set. From that point all drawing changes will be treated the same as Supplemental Specification updates.

10. Meeting Improvements (on-going agenda item) (Agenda Item 10). None

11. Other Business: None

A motion was made, seconded and approved to adjourn.

The next regular meeting of the Standards Committee has been scheduled for Thursday, October 26, 2006, at 8:00 a.m., in the 1st floor conference room of the Rampton Complex.

Approval of Minutes: The foregoing minutes were approved at a meeting of the Standards Committee held _____, 2006.

Assignment/Action Item Log

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
June 27, 2002	1	Standard Drawing PV 8 (Rumble Strip)	Darrell to assign someone from Construction.	Open	August 2006 meeting
October 31, 2002			Richard Miller from Maintenance. Fred Doehring. Betty Purdie. Robert Hull to head the group.		
December 19, 2002		- Process being reviewed. Research looking into testing.	Robert Hull Stan Burns		
February 27, 2003		- A policy is to be developed over the next several months.	Robert Hull		
April 24, 2003		- No change	Stan Burns		
June 26, 2003		- No further updates. Target date changed.			
August 28, 2003		- Progress continuing. To work with Research.			
October 30, 2003		- Process continuing.			
December 18, 2003		- Still being worked.			
February 26, 2004		- No update			
April 29, 2004		- Jim to follow up with Research.			
June 24, 2004		-Research has study with University of Utah			
August 26, 2004		- Research study complete. Policy being written.			
October 21, 2004		- Waiting for BYU study results.			
February 24, 2005		- Still being reviewed. Target changed.			
April 28, 2005		- No change			
June 30, 2005		- No one present to discuss.			
August 25, 2005		- QIT working on a policy. Item being tracked as Rumble Strip Policy.	Traffic and Safety - Robert Hull		
October 27, 2005		- December meeting canceled. Target date updated.			

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
  February 23, 2006 April 27, 2006 June 29, 2006 August 31, 2006	1	**Item continued.** Standard Drawing PV 8 (Rumble Strip) - Policy approved. Drawing to be completed. - Policy approval discussed. Never brought to Standards for review and approval. - Committee still needs to review the policy - No change in policy review requirement. Drawing needs to be created or current drawings updated.	 Traffic and Safety - Robert Hull Steve Anderson (drawings)		October 2006 meeting
August 28, 2003 October 30, 2003 December 18, 2003 February 26, 2004 April 29, 2004 June 24, 2004 August 26, 2004 October 21, 2004 February 24, 2005 April 28, 2005 June 30, 2005 August 25, 2005 October 27, 2005	2	A new drawing depicting the three-legged/four-legged intersection to be developed. - No change in status. - Target date set. - No change. - Being developed - No report. Not due until August. E-mail sent to SAF and RES. - No change except target date. - Still under development. Target date moved. - No change. Work priorities prevented further review. - No change - No one present to discuss. - Looking at three-legged intersection first. - Not due. No action required.	John Leonard	Open	October 2006 meeting

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
	2	**Item continued.** A new drawing depicting the three-legged/four-legged intersection to be developed.			
February 23, 2006		- Reviewed by the Traffic Engineering Panel. Drawings being developed.			
April 27, 2006		- Still on target for June 2006.			
June 29, 2006		- No new status. Standards to develop new drawing	Richard Miller		
August 31, 2006		- Drawing needs to be created.	Steve Anderson		
August 25, 2005	3	Supplemental Specification 00555M, Prosecution and Progress, Limits of Operation: Coordinate the required action to have the process placed in the proper location, to the detail necessary and bring the recommendation to the Standards Committee for approval.	John Leonard	Open	Open. No date set.
October 27, 2005		Item not ready. To be reviewed by the Operations Engineer. Target date updated.			
February 23, 2006		Direction being reviewed by upper management.			
April 27, 2006		Still being review by upper management for direction.	Tracy Conti Robert Hull		
June 29, 2006		No change other than item may be on hold.			
August 31, 2006		No change.			

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
April 27, 2006 June 29, 2006 August 31, 2006	4	Put team together to review the removal of Sheets 1B and 1C and make recommendation. To be reviewed with Construction and recommendation made. Removal of Sheets 1B and 1C approved in separate meeting. New hard copy drawing book to be printed and procedures updated	Richard Miller Barry Axelrod	Open	October 2006 meeting.
August 31, 2006	5	Check Supplemental Specification 02896M for wording on the mark or dimple and who places the mark or dimple. The Supplemental Specification covers the requirement so there is no need to duplicate on the Standard Drawing. The surveyor who sets the right of way marker (usually the contractor's surveyor) should set, mark and file a record of survey for the project. It could be a UDOT surveyor if UDOT does the construction staking.	Barry Axelrod with coordination with James Baird	Closed	None
August 31, 2006	6	Supplemental Specification 02844, Concrete Barrier and Standard Drawing BA 3C, Precast Constant Slope Barrier. Resolve issues brought up during meeting discussion and determine barrier length.	Steve Anderson	Open	October 2006 meeting.
August 31, 2006	7	Supplemental Specification 02765, Pavement Marking Paint. To be updated to meet Materials and Maintenance requirements.	Tim Biel Degen Lewis Vincent Liu	Open	October 2006 meeting.

Closed Items From Last Meeting (August 31, 2006)					
Date Initiated/Updated	Prior Item #	Action	Assignments	Status	Target Date
None					

Standards Committee Agenda Items Section

Submittal Sheets, Supplemental Specification Drafts, Standard Drawing Drafts, and other supporting data for the August 31, 2006 Standards Committee meeting follows.

Standards Committee Submittal Sheet

Name of preparer: Steven K. Anderson
Title/Position of preparer: Value Engineering Manager
Specification/Drawing/Item Title: Pre-cast Constant Slope Concrete Barrier
Specification/Drawing Number: 02844 / New BA 03C drawing

Enter appropriate priority level:
(See last page for explanation) **3**

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web. (http://www.udot.utah.gov/index.php/m=c/tid=303)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

UDOT used cast-in-place constant slope barrier in Urban Freeway applications. The regions have asked for the option of using precast constant slope concrete barrier that meets NCHRP 350 crash test requirements. The current system being used has not been crash tested. This specification and drawing will adopt a system from the Texas Department of Transportation that has been tested and approved for NCHRP 350 for sections 10-30 feet long and this system allows for sections to be built in any length in between.

Rich Clarke checked with the maintenance crews and equipment will allow for 15 foot sections.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

A new bid item created for Pre-cast Constant Slope Concrete Barrier paid for by the foot.

C. Stakeholder Notification for AGC and ACEC:
By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.
Note: There is a two-week response time set for this item.
Refer to the Standards Committee Web site, Members page at http://www.udot.utah.gov/index.php/m=c/tid=659 for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)
Mont Wilson
No comment received

ACEC Comments: (Use as much space as necessary.)
Tyler Yorgason

With regard to the proposed changes in the 02844 Specification:

1. Change "Treaded" to "Threaded" in 2.2.B
2. Should Cast-in-Place be added to the heading of 2.5 to read "CAST-IN-PLACE CONCRETE BARRIER"?
3. Re-number the second 3.2 and following paragraphs to eliminate the duplication.
4. Should the heading for the first 3.2 be changed to read "PRE-CAST STANDARD CONCRETE BARRIER"? If it is intended to cover both standard and constant slope barrier, eliminate 3.2.A from the second 3.2.

I am attaching a PDF copy of a red-lined BA Standard Drawing. Also, I received the following comments from Dan Church at PB regarding the new BA Standard Drawing:

1. Upper Connection Threaded Rod Details: Correct spelling of "Details"; Revise Dia. of A325 Rod to 7/8" to match nut.
2. Lower Connection Threaded Rod Details: Revise "Upper" to "Lower"; Revise Dia. of A325 Rod to 7/8" to match nut.
3. Connection Details: Place space between "After" and "Fabrication".
4. Reinforcement for Precast Constant Slope Concrete Barrier (Type 1): Clarify 30'-0"_+ 1" dimension. Should it be 30'-0" +/- 1"?
5. Barrier Plan At Joint: Add (Typ) to bottom orthogonal Leave-Out dimensions; "Block-Out" is the commonly used term for "Leave-Out".
6. Deformed Bar Anchor Details: Use 3'-7" length instead of 3'-3" to fully develop bar strength per AASHTO requirements.
7. Section A-A: Use 8'-10" long #5 bars at drainage slots to fully develop bar strength by splices per AASHTO requirements.
8. Constant Slope Concrete Traffic Barrier: Top Outside 8 5/8" dimension should be 8" (Typ).

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Ben Huot	Glen Schulte	Pete Negus
Betty Purdie	John Leonard	Randy Jefferies
Boyd Wheeler	Karl Verheaeren	Rex Harris
Bret Sorenson	Kevin Griffin	Richard Clarke
Clark Mackay	Merrell Jolley	Richard Miller
Dave Babcock	Mike Donivan	Steve Park
Dave Schwartz	Mike Miles	Tim Rose

Karl Verhaeren

The titles of articles 2.4 and 2.6 are modified to include the word "standard". This seems a little awkward or confusing. The BA drawings refer to "standard section" barriers. This even seems odd, as they're all part of our "standards". Hindsight I suppose, but it seems like the choice of the terms used in our BA series drawings is poor.

I think the differentiation is between constant slope and "standard section" barrier. There may be a better solution for clarifying the terms, but it would probably require renaming several drawings, bid items, etc. - but I would suggest possibly adding the word "section" after the word "standard" that's been inserted in the two article titles.

In spite of what Word does, I don't think we want to hyphenate pre-cast. Refer to recent supplementals 02633 and 02645 and also to the proposed 02844 title of article 2.4. Also, study 2.6 A as an example.

We should at least be consistent and I think we've probably already established precast (no hyphen) as a term in other specifications, the UDOT Quality Management Plan, and probably elsewhere (Bid system, etc.).

2.2 B. Is this a "threaded" rod?
2.6 B. Need hyphen between "11/2 ' and "inch"
2.6 D. "Do not ship until:" instead of "Accept for shipment when:"

Randy Jefferies
Looks good. Thanks for chasing this through standards. I hope you're successful.

Lynn Bernhard
2.4 C Replace “should return” with returns
2.4 D Replace “must remain” with remains

Boyd Wheeler
Supplemental Specification comments
Add reference for welding 1.3 D. ANSI/AASHTO/AWS D1.5
2.2 add “Structural” Steel
2.4 Barrier Seal should be used on all pre-cast barrier where needed
2.8 Surface sealing should be applied to all type of barriers
3.2 Add D tighten bolt requirement for X-connection
3.3 F change “Coating” to Penetrating Concrete Sealer
Standard drawing comments
Define centerline
Fix dimension for barrier length
Add (Only when specified) for drainage slot
Add note for barrier seal between sections

Glenn Schulte
Add Barrier marking requirements
Add pad requirements
Define Stabilization Pin
Define S-1 and S-2 Bars
Larger lifting hole

Contractors (Any additional contacts beyond “C” above.)
Gerber Construction
Oldcastle

No comments received

Suppliers
Eagle Precast

No comments received

Consultants (as required) (Any additional contacts beyond “C” above.)
Stanley Group

No comments received

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)
Carlos Machado
Todd Emery

No comments received

Others (as appropriate)

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)
   N/A
2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)
   N/A
3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)
   N/A

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.
   The connecting X-bolts cost approximately $100 per stick extra.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

   The lifting capabilities of Contractor's and Maintenance equipment can be the determining factor in the length of barrier used.

3. Life cycle cost.

   If the barrier is permanent, the extra time and cost for the shorter barrier segments is a one-time expense. If the barriers are to be used for temporary construction or maintenance work, the longer barriers allow more length to be placed in a day. Lengths used can be determined by existing equipment.

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

It is less expensive to use longer barrier sections. They are quicker to install or remove. Different lengths can be installed and tracked for time and cost comparisons.

H. Safety Impacts?

Longer sections deflect less under impact

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Barrier systems are in use now with no drawing or specification to support them.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

Supplemental Specification
2005 Standard Specification Book

SECTION 02844

CONCRETE BARRIER

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Pre-cast concrete barriers: New Jersey shape, full, half, and terminal section.

B. Pre-cast constant slope concrete barrier.

C. Cast-in-place concrete barriers.

1.2 RELATED SECTIONS

A. Section 01554: Traffic Control

B. Section 02842: Delineators

C. Section 03055: Portland Cement Concrete

D. Section 03211: Reinforcing Steel and Welded Wire

E. Section 03390: Concrete Curing

F. Section 03392: Penetrating Concrete Sealer

1.3 REFERENCES

A. ASTM A 36: Carbon Structural Steel

B. ASTM A 325: Standard Specification for Structural Bolts

C. UDOT Quality Management Plan

D. ANSI/AASHTO/AWS D1.5

PART 2 PRODUCTS

2.1 CONCRETE

A. Class AA(AE). Refer to Section 03055.

2.2 STRUCTURAL STEEL

A. Connection pins, connection loops, and stabilization pins. Refer to ASTM A 36.

B. Connection Treaded Rod. Refer to ASTM A 325

2.3 REINFORCING STEEL AND WELDED WIRE FABRIC

A. As specified, refer to Section 03211. Refer to ANSI/AASHTO/AWS D 1.5.

2.4 BARRIER SEAL FOR ALL PRECAST CONCRETE BARRIER

A. Polyester polyurethane open-cell foam 100 percent impregnated with asphalt.

B. Foam unit weight requirements:
   1. Before impregnation: 68 lbs/yd^3 to 85 lbs/yd^3.
   2. After impregnation: 252 lbs/yd^3 to 270 lbs/yd^3.

C. Impregnated asphalt foam returns to 95 percent of its original volume when compressed to 25 percent of its volume and released.

D. Impregnated asphalt foam remains stable at temperatures ranging from -40 degrees F to +150 degrees F.

2.5 CONCRETE BARRIER

A. Use the specified reinforcing steel as per applicable BA Series Standard Drawings, as the reinforcing component. Refer to Section 03211.

B. Hot and cold weather limitations. Refer to Section 03055.

2.6 PRE-CAST NEW JERSEY SHAPE SECTION AND CONSTANT SLOPE CONCRETE BARRIER

A. Pre-qualify the fabricator as a supplier of pre-cast concrete products in accordance with the Quality Management Plan: Precast-Prestressed Concrete Structures.

B. Mark each barrier with 1½ inch numbers indicating the date of casting and identification number supplied by the inspector. Impress ¼ inch deep into the top center of the barrier.

C. Prevent cracking or damage during handling and storage of precast units. Replace cracked or damaged precast units at no additional cost to the Department.

D. Accept for shipment when:
   1. 28-day compressive strength acquired.
   2. Cured and sealed according to Section 03390.
   3. Visually inspected and accepted by the Engineer.

2.7 BARRIER DELINEATION

A. Sheeting: Refer to Section 02842.

B. Hardware: Refer to GW Series Standard Drawings.

2.8 SURFACE SEALING MATERIAL FOR ALL BARRIER TYPES

A. Refer to Section 03392.

2.9 EXTRUSION AND SLIP FORM MACHINES FOR CAST-IN-PLACE CONSTANT SLOPE BARRIER

A. Capable of vertical adjustment to the grade line while in forward motion.

B. Use equipment with an attached grade line gauge or pointer to make a continual comparison with the barrier being placed and the offset guideline.

PART 3 EXECUTION

3.1 PREPARATION

A. Site considerations:
   1. Protect work area when removing traffic barriers and crash cushions until the barriers and crash cushion are reconstructed or the hazard is mitigated. Refer to Section 01554.
   2. Precast Concrete Barrier: Complete grading requirements and place any required paved surfaces as per BA Series Standard Drawings before installing barrier. Complete grading requirements prior to installation of barrier or crash cushions reference CC Series Standard Drawings.

B. For cast-in-place constant slope protection:
   1. Before applying curing compound, give the surface a final soft brush finish with strokes parallel to the line of barriers.
   2. Do not finish with a brush application of grout.
   3. Refer to Section 03392.
   4. Complete grading requirements prior to installation of crash cushions reference CC Series Standard Drawings.

3.2 PRE-CAST CONCRETE FULL BARRIER (NEW JERSEY SHAPE) AND CONSTANT SLOPE CONCRETE BARRIER

A. Installation includes moving, stockpiling, and placing all barriers.

B. Place seal between each barrier unit so that enough pressure is exerted on the sealing material to form and maintain a permanent bond.

C. Conform to BA Series Standard Drawings.

D. Tighten X-connection bolt until snug and then add one turn.

3.3 CAST-IN-PLACE CONSTANT SLOPE CONCRETE BARRIER

A. Obtain Engineer approval before placing the barrier.

B. Conform to BA Series Standard Drawings.

C. Fixed forms: Do not use precast mortar blocks to support the reinforcing steel.

D. Constant slope barrier placed by extrusion or slip form:
   1. Provide an offset guideline for the extrusion or slip form machine to maintain the predetermined grade.
   2. Feed concrete to the extrusion or slip form machine at a uniform rate.
   3. Operate machine, uniformly restraining forward motion.
      a. Produce well-compacted, dense concrete with consistency that maintains the shape of the barrier without support.
      b. Produce a well-compacted mass of concrete free from surface pits larger than 1 inch in diameter and requiring no further finishing.
   4. Saw or form joints before applying curing compound.

E. Curing: Refer to Section 03390.

F. Penetrating Concrete Sealer:
   1. Application rate based on resident content at a coverage rate of 0.11 lbs/yd^2.
   2. Apply according to the manufacturer's recommendation for horizontal, vertical, and all surfaces.
   3. Select a sealer with maximum drying time of 1½ hours.

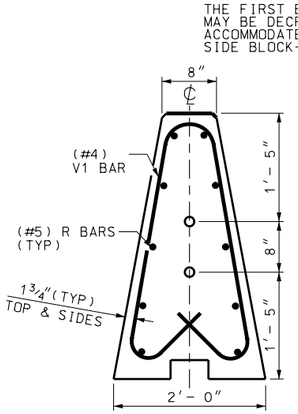
3.4 DELINEATION HARDWARE

A. Concrete Barrier: Attach L Barrier Reflector. Refer to GW Series Standard Drawings.

B. Attachment Location: Refer to BA Series Standard Drawings.

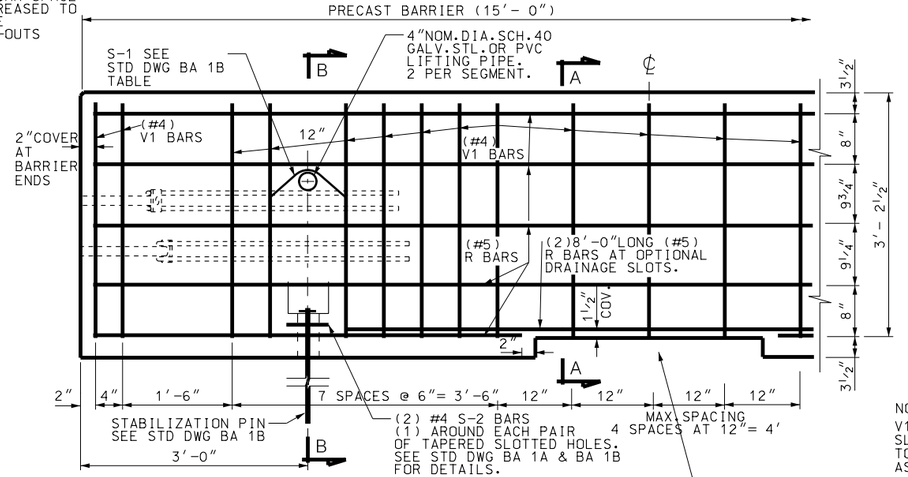
C. Application: Refer to GW Series Standard Drawings.

END OF SECTION



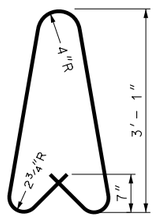
PRE-CAST BARRIER END SECTION

PIPE LOCATIONS FOR JOINT TYPE X CONNECTION



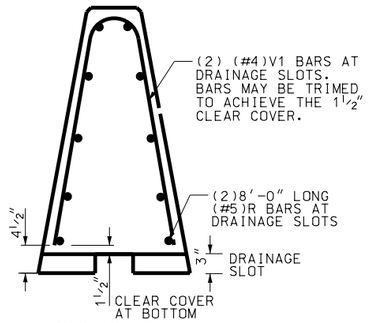
REINFORCEMENT FOR PRE-CAST CONSTANT SLOPE CONCRETE BARRIER (CSCB) (TYPE 1)

SHOWING REINFORCEMENT FOR JOINT CONNECTION ON (TYPE X)



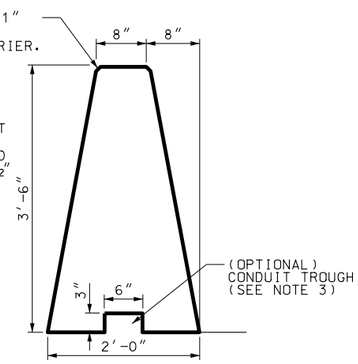
V1 BAR
#4 REBAR

NOTE:
V1 BARS ABOVE THE DRAINAGE SLOT MAY NEED A MODIFICATION TO ACCOMMODATE 1 1/2″ CLEAR COVER AS DIRECTED BY THE ENGINEER.



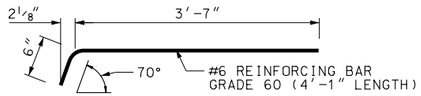
SECTION A-A

STEEL PLACEMENT AT (REQUIRED) DRAINAGE SLOT



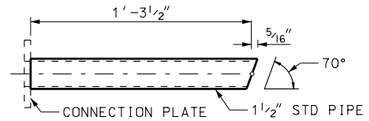
CONSTANT SLOPE CONCRETE TRAFFIC BARRIER

THE TYPE X JOINT CONNECTION MAY BE USED IN CAST-IN-PLACE BARRIER WHEN ADJACENT TO PRE-CAST CSCB TO MATCH THE JOINT CONNECTION.



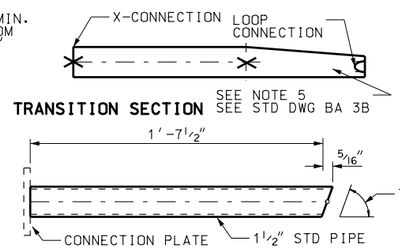
DEFORMED BAR ANCHOR DETAILS

(2) BARS REQUIRED PER ASSEMBLY.
(8) REQUIRED PER JOINT.



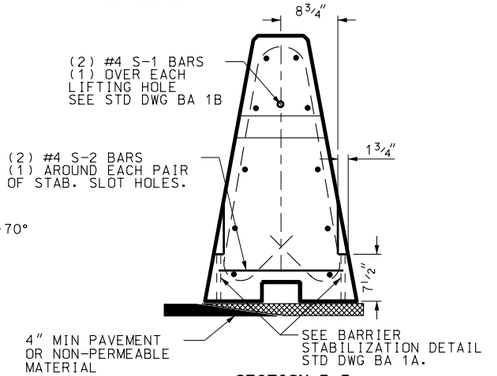
UPPER CONNECTION PIPE DETAILS

(1) STEEL PIPE REQUIRED PER UPPER ASSEMBLY.
(2) REQUIRED PER JOINT.

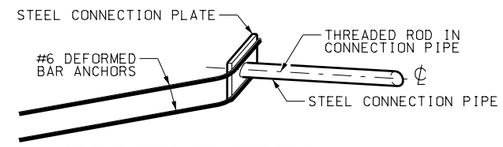


LOWER CONNECTION PIPE DETAILS

(1) STEEL PIPE REQUIRED PER LOWER ASSEMBLY.
(2) REQUIRED PER JOINT.

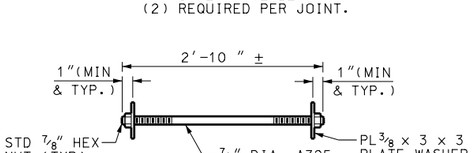


SECTION B-B



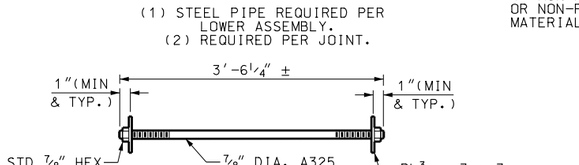
ISOMETRIC OF TYPICAL WELDED ASSEMBLY

(4) (2 UPPER & 2 LOWER) ASSEMBLIES REQUIRED PER JOINT.



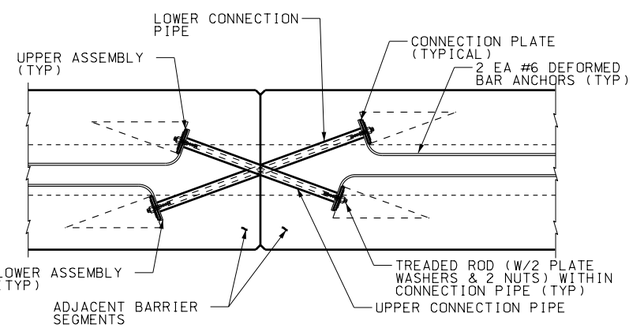
UPPER CONNECTION THREADED ROD DETAILS

(1) UPPER THREADED ROD (W/2 PL 3/8 x 3 x 3 PLATE WASHERS & 2 STD HEX NUTS) REQUIRED PER JOINT.



LOWER CONNECTION THREADED ROD DETAILS

(1) UPPER THREADED ROD (W/2 PL 3/8 x 3 x 3 PLATE WASHERS & 2 STD HEX NUTS) REQUIRED PER JOINT.



TYPE X JOINT INSTALLATION DETAIL

BARRIER REINFORCING AND TYPE X JOINT BLOCK-OUT DIMENSIONS NOT SHOWN FOR CLARITY.

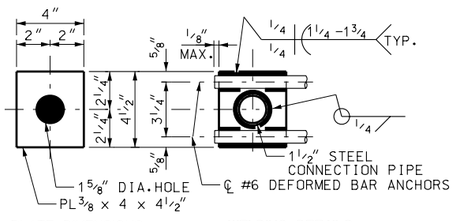
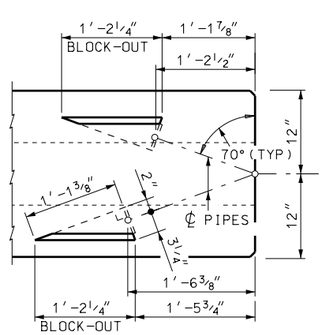


PLATE DIMENSIONS **WELDING DETAILS**

CONNECTION PLATE DETAILS

(1) PLATE REQUIRED PER ASSEMBLY.
(4) REQUIRED PER JOINT.
GALVANIZE ALL STEEL FITTINGS FOR JOINT TYPE AFTER FABRICATION.

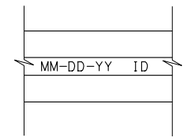


BARRIER PLAN AT JOINT (TYP.)

NOTES:

1. USE CLASS AA(AE) CONCRETE.
2. USE COATED REINFORCING STEEL.
3. CONDUIT TROUGH MAY BE OMITTED, AS SHOWN ELSEWHERE OR AS DIRECTED BY THE ENGINEER.
4. GALVANIZE ALL STEEL COMPONENTS AFTER FABRICATION EXCEPT REINFORCING STEEL UNLESS NOTED OTHERWISE.
5. IN THE TRANSITION FROM PRE-CAST CSCB TO CRASH CUSHION OR W-BEAM GUARD RAIL INSTALL CONSTANT SLOPE TRANSITION SECTION AS PER STD DWG BA 3B.
6. WHEN MATCHING INTO EXISTING CAST-IN-PLACE BARRIER. STD DWG BA 3B USE LOOP CONNECTION ON CAST-IN-PLACE END AND X-CONNECTION ON THE OTHER END.
7. MARK EACH BARRIER WITH 1 1/2″ NUMBERS INDICATING THE DATE OF CASTING AND IDENTIFICATION NUMBER SUPPLIED BY THE INSPECTOR. IMPRESSED 1/4″ DEEP INTO THE TOP CENTER OF THE BARRIER.
8. FOR BARRIER SEAL DETAILS SEE STD DWG BA 1B.

WEIGHT OF PRE-CAST CONSTANT SLOPE CONCRETE BARRIER 717 lbs/ft



BARRIER MARKINGS
SEE NOTE 7

NO.	DATE	APPR.	REMARKS
1	10/26/06	SA	NEW DRAWING.

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — OCT.26.2006 DATE
CHAIRMAN STANDARDS COMMITTEE APPROVED — OCT.26.2006 DATE
DEPUTY DIRECTOR

PRE-CAST CONSTANT SLOPE CONCRETE BARRIER
(TYPE X JOINT CONNECTION)

STANDARD DRAWING TITLE

STD DWG
BA 3C

DGN File:L:\Standard_Drawings\Imperial\2005Working\Standard_Committee Files\November-06\BA3C.dgn
09-NOV-2006

Standards Committee Submittal Sheet

Name of preparer: Karl Verhaeren

Title/Position of preparer: Engineer for Construction

Specification/Drawing/Item Title: **00555** - Prosecution and Progress; **00570** – Definitions, **00725** - Scope of Work; **00727** - Control of Work; **01282** - Payment

Specification/Drawing Number:

Enter appropriate priority level:
(See last page for explanation) **3**

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web. (http://www.udot.utah.gov/index.php/m=c/tid=303)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

The proposed changes are a result of a comprehensive review for purposes of updating all of the general provision sections. General provision sections 00120 – Instructions to Bidders, 00515 – Award and Execution of Contracts, 00820 – Legal Relations and Responsibilities to the Public, and 01280 - Measurement will be updated and submitted at a later date.

The current approved AASHTO Guide Specifications, along with in-progress changes to the guide specifications, and the general provisions of other DOTs were reviewed in conjunction with the review and revision of these sections. The revisions clarify many contract requirements, including those dealing with contract modifications due to time extensions, differing site conditions, changes, and extra work. Special attention has been given to clarification of sections dealing with contractor notification and requirements for requests or claims for additional compensation or time, specifying the requirements of both parties in dealing with these contract adjustments.

Several definitions have been added to section 00570. The added definitions and changes to the general provisions are consistent with the current and proposed AASHTO Guide Specifications for Highway Construction.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No changes to measurement and payment

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at http://www.udot.utah.gov/index.php/m=c/tid=659 for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)
Sent to Norm Avery (WW Clyde) and Mont Wilson (Granite) on September 18, 2006 for review and comment.
Comments were requested by October 2, 2006. No comments received from the AGC as of October 24, 2006.

ACEC Comments: (Use as much space as necessary.)
Sent to ACEC on September 18, 2006 for review and comment.
Comments were requested by October 2, 2006. No comments received from the ACEC as of October 24, 2006.

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

In the course of updating these sections, and in addition to the comments indicated below, many comments were received from Jim McConnell, Barry Axelrod, Patti Charles, Richard Miller, Larry Myers, Scott Nussbaum, Clark Mackay, Trent

Nielsen, Beckie Case, and Lloyd Hunt. All comments/suggestions were considered and either addressed in the final draft or explained.

Construction Engineers

Initial draft distributed to the Region Construction Engineers at the June 28, 2006 meeting. No comments were received.

Final draft distributed to District Engineers on September 25 and sent to all Resident Engineers on October 10, 2006.

Comments received from Scott Andrus (R3 District Engineer):

00555: Article 1.13 C Where do we define Partial Suspension?
We don't - Not necessary

00725: Article 1.12 J Why are we eliminating this?
It is included language in RR Right-of-Entry agreement and therefore redundant

01282: Article 1.8 A 1 Seems confusing.
Rewritten to clarify requirements – Scott agreed with changes

No other comments received from the District or Resident Engineers as of October 24, 2006.

Contractors (Any additional contacts beyond "C" above.)

Comments received by phone from Travis Farr (Wadsworth Bros):

Force Account needs to consider expended materials such as drill bits, saw blades, etc. that may be used in performing work on a force account basis.
Changes made to include expended materials in performing work on force account basis

Question on formula for home office overhead computation.
Formula is correct as intended.

Suppliers

Consultants (as required) (Any additional contacts beyond "C" above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Intermediate draft provided to FHWA September 7, 2006. Final draft sent on September 18, 2006.

Others (as appropriate)
Sent to all members of the Standards Committee on September 18, 2006.

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

   No changes to Minimum Sampling and Testing Requirements

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

   No changes to any business systems

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

   Information concerning the revisions to the general provisions will be provided to the Resident Engineers and District Engineers. Suggested preconstruction meeting agenda will be revised to include discussion of the requirements for requests or claims for additional compensation and contract adjustments.

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.
   N/A

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
   N/A

3. Life cycle cost.

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Clarification of requirements and procedures for dealing with claims and contract changes in a timely manner should reduce the number of claims escalated beyond the Resident Engineer's authority level and minimize and/or mitigate claims issues, resulting in significant dollar savings.

H. Safety Impacts?

N/A

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

N/A

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

Supplemental Specification
2005 Standard Specification Book

SECTION 00555

PROSECUTION AND PROGRESS

Delete Section 00555 in its entirety and replace with the following:

PART 1 GENERAL

1.1 RELATED SECTIONS

A. Section 00570: Definitions

B. Section 00725: Scope of Work

C. Section 00727: Control of Work

D. Section 01282: Payment

E. Section 01355: Environmental Protection

1.2 PRECONSTRUCTION CONFERENCE

A. Contact Engineer within 14 calendar days of receiving Notice of Award to schedule ~~Pre-Construction~~preconstruction ~~C~~conference ~~following Notice of Award~~.

1.3 NOTICE TO PROCEED

A. Proceed with the work after receipt of written notice from the Department.

B. Notify the Engineer at least five calendar days before beginning work.

1.4 SUBLETTING THE CONTRACT

A. Obtain written approval of the ~~Department~~ Engineer before subletting, selling, transferring, assigning, or disposing any portion of the ~~C~~contract ~~or Contracts~~.

B. Sublet no more than 70 percent of the total contract ~~work~~ bid amount.

C. Subcontracts, whether committed to in writing or by an informal, unwritten arrangement or transfer of the ~~C~~contract, or any part of it or its obligations, do not relieve liability under the ~~C~~contract and bonds. As part of its contract with the Department, the Contractor accepts liability for any claims for damages or liability resulting from an act or omission of any person who carried out work on its behalf, whether that working relationship is ~~codified into~~through a subcontract or carried out by an informal, unwritten agreement. The Contractor agrees to indemnify the Department for any damages or liability, including attorney's fees and court costs, ~~that~~ which may be incurred by such a person.

D. Do not allow subcontracted work to begin until the request to sublet work is approved by Engineer.

E. In computing the percentage of subcontracted work, the Department considers an item as subcontracted in its entirety unless otherwise designated in the subcontract.

1. The Department uses the accumulated percentages of all approved subcontracts to ~~assure~~ determine that the maximum subcontracted limitation is not exceeded.
2. To determine the amount of work subcontracted, the Department uses the total dollar amount of the items subcontracted in the ~~C~~contract ~~B~~bid ~~P~~proposal, divided by the original contract amount.
3. If the prime Contractor is to perform a portion of an item, the Department determines the amount of work subcontracted by using the dollar amount of the item agreed to between the prime Contractor and the subcontractor, excluding bonds, insurance, profit, and office transaction, etc. performed by the Contractor.

F. For all subcontracts:

1. Provide for a reduction in retained ~~monies commensurate with~~money equal to the percentage ~~held as retainage as provided for~~retained in accordance with Section 01282.
2. Include a statement describing the method of distribution of any adjustment due to price increases or decreases using applicable price adjustment specifications for fuel, asphalt, cement, common carrier rates, etc.

~~G. Include a statement agreeing on a method of distribution of any adjustments due to price increases or decreases using applicable price adjustment specifications for fuel, cement, common carrier rates, etc.~~

1.5 ANTICIPATED MONTHLY PAYMENT SCHEDULE

A. Prepare the Anticipated Monthly Payment Schedule based on the proposed sequence of activities shown in the baseline construction schedule.

1. Use the form provided by the Engineer
2. Submit the ~~proposed Monthly Payment Schedule~~schedule before the date established for the first partial payment.
3. Include both monthly and semi-monthly payments when ~~anticipated~~ expected due to the volume of work on the project.
4. Include all contract months ~~during the life of the contract~~ when payments are anticipated.
5. Include dates of contract start, suspension, completion and milestones that impact payments.

B. Submit a ~~R~~revised Anticipated Monthly Payment Schedule within 30 calendar days ~~of~~ after notification by the Engineer. ~~Payment Schedule~~ Revisions are required when:

1. ~~Actual~~ Payments vary more than10 percent ~~or more (plus or minus)~~ from the submitted ~~Payment Schedule~~schedule and the variance is sustained for 60 calendar days.
2. Contract start, suspension, completion and milestones dates change.
3. Change ~~O~~orders are approved increasing or reducing the contract amount sufficient to vary actual payments more than 10 percent ~~or more (plus or minus)~~ from the accepted ~~Payment S~~schedule.

1.6 BASELINE CONSTRUCTION SCHEDULE

A. ~~Develop~~ Provide the Engineer with a baseline construction schedule meeting the requirements of this section using Primavera 5.0 (or ~~the~~ current version) or Primavera Contractor.

1. Accurately reflect ~~in the schedule~~ the proposed approach to accomplish the work ~~outlined in the Contract documents conforming to all requirements of this article~~.
2. Provide a schedule narrative as described in this article.

B. Use the baseline construction schedule to coordinate all activities on the project, including those ~~particularly the interaction~~ with other entities~~, including, but not limited to,~~ such as subcontractors, vendors and suppliers, utilities, local governments, special service districts, and the Department.

~~F~~C. Employ a sufficient ~~work force~~workforce, supply adequate materials and equipment, and ~~prosecute~~ progress the work with such diligence as to maintain the rate ~~of progress~~ indicated in the accepted baseline construction schedule.

1. ~~Any~~All ~~additional or unanticipated~~ costs ~~required~~ to maintain the schedule ~~is~~ are solely the Contractor's obligation and ~~is~~ at no expense to the Department.

~~C~~D. Schedule Submission

1. ~~Within 14 calendar days of the Notice of Award, s~~Submit to the Engineer a baseline construction schedule ~~in a Critical Path Method (CPM) format~~ with schedule narrative within 14 calendar days of the Notice of Award~~for the Engineer's review and acceptance~~. Submit one hard copy and one electronic copy in a format acceptable to the Engineer.
2. The Engineer reviews the schedule and returns it, accepted or with comments, within seven calendar days from the date of receipt.
   a. Address any comments and revise the schedule as necessary to the satisfaction of the Engineer.
3. ~~If the schedule is returned with comments, address all comments and revise the schedule as necessary to the satisfaction of the Engineer.~~ Complete the final baseline schedule and obtain ~~the~~ Engineer's acceptance ~~of the Engineer~~ within 30 calendar days from the Notice of Award.
   a. No progress payments are made before the Engineer accepts the baseline construction schedule.
4. ~~No progress payments are made before the Engineer accepts the baseline construction schedule.~~
5. ~~Develop a 60-calendar day schedule for complex contracts exceeding 120 working days, when not practical to prepare, review, and approve the baseline construction schedule in the time frame specified above. Use the same format as required for the baseline schedule and include all activities worked on during the first 60 calendar days of the Contract.The Engineer reviews and accepts the schedule prior to the approval of the first pay estimate.~~

~~6~~4. The Contractor is solely responsible for planning and executing the work. ~~Acceptance of the baseline construction schedule by the~~ Engineer's acceptance of the baseline schedule does not:
   a. ~~i~~Imply approval of any particular construction methods or relieve the Contractor's ~~from its~~ responsibility to provide sufficient materials, equipment, and labor to guarantee the completion of the project in accordance with the contract~~. documents.~~
   b. Attest to the validity of assumptions, activities, relationships, sequences, resource allocations, or any other aspect of the baseline construction schedule.

~~7.~~ ~~Acceptance of the baseline construction schedule by the Engineer does not attest to the validity of assumptions, activities, relationships, sequences, resource allocations, or any other aspect of the baseline construction schedule. Within the contractual constraints, the Contractor is solely responsible for the planning and execution of the work.~~

~~8~~5. Failure ~~by the Contractor~~ to include any element of work required by the ~~C~~contract in the accepted baseline construction schedule does not relieve the Contractor's ~~from its~~ responsibility to perform such work.

~~9~~6. In no way does the baseline construction schedule modify the contract documents.

~~D~~E. Schedule Requirements

~~As~~ At a minimum, address the following ~~in the baseline construction schedule~~:

1. Define a complete and logical plan that can realistically be accomplished~~,~~ for executing the work defined in the ~~C~~contract.
2. Include sufficient activities ~~to assure~~for adequate project planning ~~of the project~~, including subcontractor, third party, vendor, and supplier activities.
3. ~~Comply with the phasing, work constraints, and milestones defined in the Contract as well as all other contractual terms and conditions.~~
4. 3. Clearly show the critical path ~~(~~using the longest path definition~~)~~ and other critical elements of work.
   a. ~~If the schedule is resource loaded and leveled, d~~Define the critical path of the schedule based on resource limitations if the schedule is resource loaded and leveled. ~~If an early completion schedule is accepted, the Engineer defines the additional Department cost required to support the accelerated schedule (such as increased staff for inspection and testing, overtime, etc.). The Contractor is responsible for paying these added costs unless waived by the Engineer on the basis of other benefits accrued to the Department.~~
4. If an early completion schedule is accepted, the Engineer defines the additional Department costs required to support the accelerated schedule, such as increased staff for inspection and testing, overtime, etc.
   a. Pay for these added costs unless waived by the Engineer on the basis of other benefits accrued to the Department.
5. Clearly define significant interaction points ~~between the Contractor, UDOT,~~with the Department and other entities ~~(~~such as subcontractors, vendors and suppliers, utilities, local governments, and special service districts~~, etc.)~~.
6. Designate the “Data Date” as the day ~~prior to~~before the Notice to Proceed.
7. Include a unique identification number for each schedule activity.
8. Clearly and uniquely define each activity description. Using descriptions referring to a percent complete of a multi-element task (i.e., “Construction 50 percent of Deck”) ~~are~~ is not acceptable.
9. Define the duration of each activity.
   a. ~~l~~Limit~~ing~~ the maximum duration of any activity to 15 days unless otherwise accepted by the Engineer.
10. Clearly identify the relationships tying activities together.
11. Do not have any ~~open ended~~open-ended activities, ~~(with the exception of~~except for one start and one finish ~~activities~~activity~~)~~.
12. Do not have any constrained activities unless the Engineer accepts such constraints.
13. Do not sequester project total float through manipulating the calendars, extending activities durations, or any other such methodology.

14. Use resource loading if resource limitations ~~could~~ can affect the prosecution of the work.
    a. No request or claim for contract time extension~~s tied to~~based on ~~a shortage of~~ resource~~s~~ shortages will be considered unless the baseline and subsequent schedule updates are resource loaded.
15. Include milestones to define significant contractual events such as Notice to Proceed, ~~S~~substantial ~~C~~completion, and coordination points with outside entities such as utilities, special service districts, etc.
16. Include a well-defined activity coding structure that allows project activities to be sorted by ~~total project, responsible party~~type of work, location of work, ~~type of work, work phase~~work breakdown structure (WBS), or as mutually agreed to by the Contractor and the Engineer.
17. ~~Have c~~Clearly define~~d~~ calendars.

F. Schedule Narrative Requirements

~~18.~~1. ~~Include~~ Provide a schedule ~~N~~narrative that describes:
    a. The construction philosophy supporting the approach to the ~~W~~work outlined in the baseline schedule. Address the reasons for the sequencing of work and describe any limited resources, potential conflicts, and other salient items that may affect the schedule and how they may be resolved.
    b. The justification ~~(s)~~ for activities with durations exceeding 15 working days.
    c. The justification ~~(s)~~ for constraints used.
    d. The justification ~~(s)~~ for unusual calendars used.
    e. The approach used to apply relationships between activities (for example, all ties are based on physical relationships between work activities - rebar must be placed before concrete is ~~poured~~placed; or relationships are used to show limited resources - bridge two follows bridge one because the ~~c~~Contractor only has one bridge crew; etc.).
    f. The project critical path and challenges that may arise associated with the critical path.
    g. How the ~~Contractor intends to coordinate~~coordination with other entities will be handled.

~~E~~G. Project Float

Total ~~P~~project ~~F~~float is defined as the cumulative length of time activities can be delayed before they affect the finish date of the project or a contractual milestone.

1. Float is a shared commodity between the Contractor and the Department and not for the exclusive use or financial benefit of either party.

~~2.~~ a. Either party has the full use of the project float until it is depleted.

~~F. Prosecution of the Work~~

~~Employ a sufficient work force, supply adequate materials and equipment, and prosecute the work with such diligence as to maintain the rate of progress indicated in the accepted baseline construction schedule.~~

~~1. Any additional or unanticipated costs required to maintain the schedule is solely the Contractor's obligation and is at no expense to the Department.~~

1.7 CONSTRUCTION SCHEDULE UPDATES

A. Update the construction schedule each month during the life of the contract until the closing date for the scheduled progress payment following project final acceptance.~~monthly using the closing date for the monthly progress payment and submit to the Engineer.~~

1. The Engineer does not approve progress payment until ~~the~~ an acceptable schedule update has been received.
2. Show actual progress for each activity~~;~~:
   a. Actual start and finish dates for completed activities~~;~~
   b. Actual start dates, percent complete, and remaining duration for activities in progress~~;~~
   c. Projected sequences of activities for future work~~;~~
   d. Revised relationships and durations for unfinished activities, if warranted~~; and a well defined critical path.~~
   e. A well-defined critical path
   f. Change the data date to one day after the closing date for the monthly progress payment

B. Submit one hard copy and one electronic copy of the schedule update to the Engineer for review and ~~approval~~acceptance.

C. Along with the updated schedule, submit a narrative describing:
1. ~~Actual w~~Work performed during the estimate period.
2. ~~Any p~~Problems or delays that have been experienced to date, the party responsible for the problems or delays, and the Contractor's ~~intentions~~ plan to resolve the problems or bring the delayed activities back on schedule.
3. Differences between the ~~actual~~ work performed and the work planned for the period, including explanations for the deviations.
4. The current critical path of the project, ~~highlighting~~ explaining any changes ~~to this path~~ since the last update and the impacts of ~~such~~ these changes.
6. Reasons for and impacts resulting from all of the following that apply:
   a. ~~All a~~Added or deleted activities ~~and the reason(s) for and the impact(s) of such changes.~~
   b. Changes in activity durations
   c. Changes in relationships between activities
   d. Addition or deletion of constraints

e. Changes to project calendars

~~6. All changes in activity durations and the reason(s) for and the impact(s) of such changes.~~

~~7. All changes in relationships between activities and the reason(s) for and the impact(s) of such changes.~~

~~8. The addition or deletion of constraints and the reason(s) for and the impact(s) of such changes.~~

~~9. All changes to the project calendars and the reason(s) for and the impact(s) of such changes.~~

~~10~~7. The work to be accomplished during the next period. Provide ~~reasoning~~ reasons for ~~any~~ deviations from the previous schedule update.

~~11~~8. ~~All p~~Potential problems that may be encountered during the next period and the proposed solutions ~~to such problems~~. ~~Particularly, i~~Identify all potential problems the Department may be party to and~~.~~ ~~E~~explain what action the Department needs to take and the date by which time the action needs to be taken to avoid the problem.

D. At the request of ~~T~~the Engineer, ~~conducts a monthly review of the updated construction schedule.~~ participate in a progress meeting to review and discuss the updated schedule ~~1. This review occurs within one week of the receipt of the Contractor's updated~~ information, including ~~and serves as the forum to discuss~~ any activity ~~slippages~~delays, remedies, schedule revisions, coordination requirements, change orders, potential ~~Contractor~~ delays ~~claims~~, and other relevant issues.

~~2~~1. ~~The Contractor's~~Make available the project manager, scheduler, and appropriate field personnel to participate in ~~these reviews~~the progress meeting.

~~3~~2. ~~Compile~~ Make and record an action item list that describes who is responsible for resolving existing or pending issues and the date by which the issue needs to be resolved to avoid contract delays.

~~4~~3. Submit a revised schedule update if necessary.

~~1.8 CONSTRUCTION SCHEDULE DELAYS~~

~~A. A construction schedule delay is defined as an event, action, or other factor that impacts the critical path of the construction schedule and extending the time needed to complete the construction project. There are four types of delays:~~

~~1. **Excusable Delay** - An excusable delay is one caused by an unforeseeable event beyond the Contractor's control. Such delays, where the Contractor may be granted added time but no additional money, include, but are not limited to, acts of God, acts of public enemies, fires, floods, area wide strikes, utility conflicts, and unusually severe weather.~~

~~2. **Compensable Delay** - A compensable delay is one solely caused by the Department or its representatives. Such delays include, but are not limited to, Department ordered suspension of the work, design errors, and~~

differing site conditions. Compensable delays may entitle the Contractor to additional time and monetary compensation.

3. **Inexcusable Delay** - An inexcusable delay is one that the Contractor could have foreseen and prevented but failed to do so. In such cases, the Contractor is responsible for all cost and time impacts resulting from the delay for all parties affected. Examples of events that cause inexcusable delays include weather or failure by the Contractor to assign sufficient resources to the project.

4. **Non-Critical Delays** - Non-critical delays are delays, regardless of cause, that do not impact the critical path of the project. No added time or monetary compensation is given the Contractor for such delays. If the delay is sufficiently long to eventually place the impacted activity(s) on the critical path of the construction schedule, the time period the delay affects the critical path will be handled as defined above.

B. Upon determining critical activities have been delayed, provide written notification to the Engineer within seven calendar days of the delay-causing event. Provide detailed information including:

1. The events that caused the delay.
2. Party(s) responsible for the events.
3. Activities in the construction schedule affected by the events.
4. The magnitude of the delay using the current update of the construction schedule.

C. The Engineer reviews the request and within 14 calendar days provides a written response to the Contractor. If the Engineer agrees with the request, a time extension and added compensation, if applicable, will be granted under the terms of the Contract.

D. If the Engineer disagrees with the request, a clear explanation will be included in the letter. This letter serves as formal rejection of the request by the Department.

E. Once a delay-causing event is identified, take all reasonable steps needed to minimize the impact of the delay. Failure to do so results in the rejection of all or part of the delay claim.

1.98 LIMITATION OF OPERATIONS

A. Conduct the work to mMinimize interference with traffic during performance of the work.

B. Sundays or holidays: Do not perform any work without written approval except for repairing or servicing of equipment, protection protecting of work, maintenance maintaining or curing of concrete, or and maintenance maintaining of traffic on Sundays or holidays.

C. Night work:

1. Provide five calendar day~~'~~s notice before starting night work.
2. Provide adequate lighting for performing satisfactory inspection and construction operations.
3. Control noise and vibration in accordance with Section 01355.

1.~~10~~9 CHARACTER OF WORKERS

A. Provide sufficient resources to complete all work in accordance with the ~~C~~contract and employ workers with the skills and experience necessary to perform the work.

B. Remove from the project any ~~person employed~~employee who performs the work in an improper or unskilled manner~~,~~ or who is intemperate or disorderly. ~~Rehire~~ Return these employees to the project only with the Engineer's written permission.

C. The Engineer may suspend work for the Contractor's ~~F~~failure to remove any employee~~(s)~~ or ~~to~~ furnish suitable and sufficient personnel to perform the work ~~may result in a written notice to suspend the work~~.

1.~~11~~10 METHODS AND EQUIPMENT

A. Use equipment of the size and mechanical condition to perform and produce the specified work.

B. Do not damage the roadway, adjacent property, or other highways.

C. When methods or equipment are specified in the contract, ~~Use~~ use methods or equipment other than ~~those~~ specified only with the Engineer's written permission.

1. Describe in writing the proposed methods and equipment ~~to be used~~ and the reasons for the change.
2. Once ~~approval is received~~approved, produce work that ~~meeting~~ meets project requirements.
3. Discontinue ~~use of~~ alternate methods or equipment if the Engineer determines that the work does not meet contract requirements.
4. Remove and replace or repair deficient work to ~~return it to~~meet specified quality at no cost to the Department.
5. The Department does not change the basis of payment or contract time for a change in methods or equipment.

1.~~12~~11 CONTRACT TIME

A. Contract time begins 10 ~~C~~calendar days after the date of the Notice to Proceed, unless otherwise specified.

B. The ~~C~~contract ~~D~~documents define the time allowed to complete the ~~C~~contract. Contract time is measured in either ~~W~~working ~~D~~days or ~~C~~calendar ~~D~~days as defined in Section 00570. When a completion date is specified, the completion date is when the contract is required to be substantially complete.

1. When the contract defines the time allowed to complete the contract in working days or calendar days, the Department excludes ~~Calendar~~ the days elapsing between the effective dates of any orders of the Engineer to suspend and resume work that are not the fault of the Contractor.

~~2. Completion Date: The date when the Contract work is specified to be Substantially Complete.~~

C. The Engineer furnishes a Monthly Status of Contract Time showing the number of days expended to date and the number of days remaining for ~~S~~substantial ~~C~~completion.

1. This statement is considered correct unless a written protest documenting the differences is submitted to the Engineer within ~~10~~ seven calendar days of ~~the schedule update review meeting~~receipt.
2. File a written protest with the Engineer within seven calendar days of receiving Monthly Status of Contract Time charges on working day contracts when not in agreement with the time assessed.~~Immediately resolve any differences with the Engineer.~~
   a. Document asserted discrepancies in the time assessed.
   b. Failure to file a protest is acceptance of the time assessments.

D. Refer to Section 00570 for definitions of ~~S~~substantial ~~C~~completion, physical completion, and contract completion. ~~– the day, determined by the Engineer, when all of the following have occurred:~~

~~1. The public (including vehicles and pedestrians) has full and unrestricted use and benefit of the facilities both from the operational and safety standpoint, and~~

~~2. All safety features are installed and fully functional, including, but not limited to, illumination, signing, striping, barrier, guard rail, impact attenuators, delineators, and all other safety appurtenances, and~~

~~3. Only minor incidental work, replacement of temporary substitute facilities or correction or repair remains for the Physical Completion of the Contract, and~~

~~4. The Contractor and Engineer mutually agree that all work remaining will be performed without lane closures, trail/sidewalk closures, or further delays, disruption, or impediment to the public.~~

~~E. **Physical Completion** - the day, determined by the Engineer, when all construction work required by, or incidental to, the Contract (including all punch~~

~~list work, final cleanup, and demobilization) is physically completed and the only outstanding obligation under the Contract is the submittal or processing of documentation.~~

~~F. **Contract Completion** - the day, determined by the Engineer, when all work specified in the Contract is completed and all obligations of the Contractor under the Contract are fulfilled.~~

~~1. Furnish all documentation required by the Contract and required by law before this date.~~

1.~~13~~12 ~~EXTENDING CONTRACT TIME~~DETERMINING COMPENSATION AND CONTRACT TIME EXTENSION FOR EXCUSABLE DELAYS

A. Request ~~additional~~ a contract time extension for excusable delays in accordance with this article. Refer to Section 00570.~~as part of project change orders covering quantity overruns, extra work requested by the Department, suspensions of work, and other excusable delays.~~

1. ~~Time added to Calendar Day and Completion Date contracts is in calendar days.~~ Time may be granted for noncompensable delays that impact the project schedule's critical path. Additional compensation will not be granted.
2. ~~Time added to Working Day contracts is in working days.~~ Time and monetary compensation may be granted for compensable delays that impact the project schedule's critical path and the Contractor's costs.

B. Provide a written request to the Engineer within seven calendar days of the occurrence of an excusable delay detailing the reasons for a time extension and additional compensation, if applicable. The Engineer responds to the written request as described for differing site conditions, changes, and requests or claims for additional compensation as specified in Section 00725.

1. Once a delay-causing event is identified, take all reasonable steps to minimize the impact of the delay. Failure to do so may result in the rejection of all or part of the delay claim.
2. Costs allegedly incurred before notification of delay are not allowed.
3. Provide the Engineer with a schedule impact analysis showing the impact of the delay-causing event on the project schedule.
4. Maintain daily records of all labor and material costs, station locations, and equipment expenses for all operations affected.
   a. Obtain Engineer's concurrence with these records on a daily basis.
5. Prepare and submit to the Engineer weekly written reports that contain:
   a. Number of days of delay.
   b. Summary of all delayed operations or those that will be delayed and the cause for delay.

c. Explain how the Department's action or omission delayed each operation, if appropriate, and estimate the time necessary to complete the project.

d. Itemize all extra costs incurred:

1) Document how the extra costs relate to the delay and how they are calculated and measured.

2) Identify all affected project employees for whom costs are being compiled.

3) Summarize equipment time charges and identify equipment by manufacturer's number.

4) Provide an accountant's certification of all costs.

6. Meet with the Engineer weekly to compare the previous week's daily records with those maintained by the Department.

a. Resolve any disagreement over weekly delay costs with the Engineer.

b. Provide written notice within 10 calendar days documenting the disagreement between Department and Contractor calculations of weekly delay costs.

c. Failure to provide written notification is interpreted as acceptance that Department records are accurate.

C. Contract adjustment is made as written modification to the contract through change order, when warranted, unless the Contractor does not notify the Engineer in accordance with this article.

1. Time will be added to the contract based on the overall extension of the critical path of the project schedule attributed to the delay-causing event.

D. Delay compensation for excusable delays is made in accordance with Section 01282.

E. If the Engineer decides a contract adjustment identified by the Contractor is unnecessary, and the Contractor does not agree with the Engineer's decision, the Contractor may pursue a claim for additional compensation or contract adjustment as specified in Section 00727.

~~B. Provide a narrative clearly explaining the cause and duration of the delay.~~

~~1. Support the narrative with a project schedule delay analysis showing the overall project critical path and substantial completion date is negatively affected by the number of days requested.~~

~~a. Base the schedule analyses on the most current project schedule update.~~

~~b. Explain any changes made to the schedule in the analysis.~~

~~c. Include an explanation of the addition or deletion of activities, modified activity durations, changes in activity relationships and constraints, and any other change that contribute to the schedule delay.~~

~~C. Partial Suspension: Suspension of work on some items as ordered by the Engineer is considered a partial suspension.~~

~~1. Applicable only to working day or calendar day contracts.~~

~~2. Engineer determines the time charged for each day on partial suspensions not the fault of the Contractor as the greater of:~~

~~a. 0.15 day~~

~~b. The quotient (rounded to hundredths) obtained by dividing the sum of the bid amount for the specific items of work not suspended by the total value of original contract amount.~~

1.~~14~~13 FAILURE TO COMPLETE ON TIME

A. Achieve ~~S~~substantial ~~C~~completion within the ~~required~~ specified ~~C~~contract ~~T~~time. The Department deducts from any money due the sum specified in the following Schedule of Liquidated Damages (Table 1) for each calendar day or working day that any work remains necessary ~~to achieve~~for ~~S~~substantial ~~C~~completion after the ~~Substantial Completion date~~specified contract time, including any approved extensions.

B. Achieve ~~P~~physical ~~C~~completion no later than 30 calendar days after ~~achieving S~~substantial ~~C~~completion. The Department deducts $210 per day from any money due ~~$210.00 per day~~ for each calendar day ~~after~~ beyond ~~the~~ 30 calendar days following ~~S~~substantial ~~C~~completion for any work ~~remains~~ necessary ~~to achieve Physical Completion~~for physical completion. Refer to Sections 00570 and 00727.

C. Achieve ~~C~~contract ~~C~~completion no later than 30 calendar days after notification of ~~achieving P~~physical ~~C~~completion/final acceptance. The Department deducts $100 per day from any money due ~~$100.00 per day~~ for each calendar day ~~after~~ beyond ~~the~~ 30 calendar days following ~~Physical Completion~~notification of final acceptance that any Contractor obligation ~~of the Contractor~~ under the ~~C~~contract remains unfulfilled. Refer to Sections 00570 and 00727.

Table 1 - Schedule of Liquidated Damages

Original Contract Amount		Daily Charge	
From more than	To and including	Calendar Day Completion Date	Work Day
$0	$100,000	$210	$830
100,000	500,000	450	950
500,000	1,000,000	680	1380
1,000,000	5,000,000	1270	2170
5,000,000	10,000,000	1860	2950
10,000,000	30,000,000	2770	4930

Original Contract Amount		Daily Charge	
From more than	To and including	Calendar Day Completion Date	Work Day
30,000,000		4100	8240

D. ~~Continuation~~ Continuing and ~~completion~~ completing ~~of~~ the work after the contract time expires does not waive the Department's rights under the ~~C~~contract.

1.~~15~~14 CONTRACT TERMINATION FOR DEFAULT

A. The Department may declare the Contractor to be in default and ~~Termination can occur~~terminate the contract if the Contractor:

1. ~~Fails to~~Does not begin the work under the ~~C~~contract within the time specified.
2. ~~Fails to~~Does not perform the work with sufficient resources to assure the prompt completion of the work.
3. ~~Fails to~~Does not ~~perform the work in accordance with the Contract~~meet contract work requirements or neglects or refuses to remove and replace rejected materials or unacceptable work.
4. ~~Discontinues the prosecution of the~~Stops work.
5. ~~Fails to~~Does not resume stopped work within the time specified upon notification from the Department.
6. Becomes insolvent~~,~~ or is ~~declared~~ bankrupt~~,~~ or commits ~~any~~ related act~~s of insolvency or bankruptcy~~.
7. ~~Allows any final judgment to remain unsatisfied for a period of 10 calendar days~~Is nonresponsive to final third-party judgments.
8. Makes an assignment for the benefit of creditors without the Department's approval.
9. ~~Fails to~~Does not comply with ~~C~~contract requirements including minimum wage payments or EEO contract requirements.
10. Is a party to fraud.

B. The Engineer may declare the Contractor in default by written notice to the Contractor and the Surety advising them of the actions required for remedy.

C. Comply with the written notice within 10 calendar days of receipt or the Department has full power and authority to terminate the ~~C~~contract.

D. The Department may appropriate or use any or all materials ~~and equipment~~ at the project site and enter into another contract for completion of the work according to the terms and provisions thereof~~,~~ or use such methods as determined by the Department to complete the ~~C~~contract.

E. All costs and charges incurred by the Department, including the cost of completing the work under the ~~C~~contract, are deducted from ~~monies~~ money owed or that may be owed the Contractor. The Contractor and Surety are liable and must pay the Department for the difference ~~Should~~ if the expense exceeds the sum that would have been payable under the ~~C~~contract ~~, the Contractor and Surety are liable and must pay the Department the amount of the excess~~.

F. If it is determined~~,~~ after termination of the Contractor's right to proceed, ~~it is determined~~ that the Contractor was not in default~~,~~ or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for ~~the~~ public convenience ~~of the Department~~.

1.~~16~~15 CONTRACT TERMINATION ~~OF CONTRACT~~ FOR PUBLIC CONVENIENCE ~~OF THE DEPARTMENT~~

A. The Department may by written order terminate the ~~C~~contract or any portion thereof after determining that for reasons beyond the Contractor's or the Department's control, the Contractor is prevented from proceeding with or completing the work and that termination ~~would be~~is in the public interest.

1. Specifics on the termination and the effective date will be detailed in a Notice of Termination.

B. Reasons for termination may include, but are not limited to:

1. Executive Orders of the President ~~relating to prosecution of war or national defense~~or State Governor.
2. National emergency that creates a serious shortage of materials.
3. Orders from duly constituted authorities relating to energy conservation.
4. Restraining Orders or Injunctions obtained by third-party citizen action resulting from national or local environmental protection laws or where the issuance of such order or injunction is primarily caused by acts or omissions of persons or agencies other than the Contractor.
5. Court restraining orders based on acts or omissions of persons or agencies other than the Contractor.
6. Conditions determined to be in the best interest of the Department.

C. Upon receipt of Notice of Termination, immediately:

1. Stop work as specified.
2. Place no further subcontracts or order materials, services, or facilities except as approved to complete any remaining portion of the contract.
3. Terminate all subcontracts to the extent they relate to terminated work.
4. Settle all outstanding liabilities and termination settlement proposals.
5. Transfer title and deliver to the Department:
   a. Unfabricated or partially fabricated parts, work in process, completed work, supplies, and other material produced or acquired for the work terminated,

b. Completed or partially completed plans, drawings, information, and other property required to be furnished to the Department if the contract had been completed.

6. Complete work not terminated.

7. Coordinate a time and date with the Engineer to inventory materials obtained but not yet used for the project.

8. Take all necessary or directed actions to protect contract-related property that is in the possession of the Contractor and in which the Department has or may have an interest.

~~C~~D. When the Department orders termination of a ~~C~~contract effective on a certain date, the Department pays for all completed items of work as of that date at the ~~C~~contract bid price.

1. The Department pays for partially completed work either at agreed prices or by force account methods.
2. The Department pays for items that are eliminated in their entirety in accordance with Section 01282.

~~D~~E. Materials obtained by the Contractor that have not been incorporated into the project may be:

1. Purchased from the Contractor at the option of the Department at actual cost delivered to a prescribed location.
2. Disposed of as mutually agreed.

~~E~~F. Contractor may submit a claim for additional costs not covered in the ~~C~~contract after receipt of Notice of Termination from the Department.

1. Submit within 60 calendar days of the effective termination date.
2. Include cost items such as:
   a. Reasonable idle equipment time
   b. Mobilization efforts
   c. Bidding and project investigative costs
   d. Overhead expenses attributable to the project terminated
   e. Reasonable profit on work completed
   f. Subcontractor costs not otherwise paid for
   g. Actual idle labor cost if work is stopped ~~in advance of~~before termination date~~.~~
   h. Guaranteed payments for private land usage as part of original ~~C~~contract
   i. Any other direct cost the Contractor has incurred
3. The negotiated settlement figure reached with the Contractor does not include loss of anticipated profits.

~~F~~G. Make cost records available to the Department for determining the validity and amount of each item claimed~~,~~ and for providing a basis for negotiating an equitable settlement.

~~G~~H. Termination of a ~~C~~contract or portion thereof does not relieve the Contractor of contractual responsibilities for the work completed~~, nor~~ or ~~does it~~ relieve the Surety of its obligation for and concerning any just claim arising out of the work performed.

PART 2 PRODUCTS Not used

PART 3 EXECUTION Not used

END OF SECTION

Supplemental Specification
2005 Standard Specification Book

SECTION 00570

DEFINITIONS

Delete Section 00570 in its entirety and replace with the following:

PART 1 GENERAL

1.1 REFERENCES

A. ~~U. S.~~ Code of Federal Regulations

1.2 ACRONYMS AND ABBREVIATIONS

A. Interpret acronyms and abbreviations used in the Contract as follows:~~Wherever the following abbreviations are used in the Contract, they mean:~~

~~1. AAN~~		~~American Association of Nurserymen~~
1.	AAR	Association of American Railroads
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ACI	American Concrete Institute
4.	AGC	Associated General Contractors
5.	AI	Asphalt Institute
6.	AIA	American Institute of Architects
7.	AISC	American Institute of Steel Construction
8.	AISI	American Iron and Steel Institute
9.	AMRL	AASHTO Materials Reference Laboratory
10.	ANLA	American Nursery and Landscape Association
11.	ANSI	American National Standards Institute
12.	API	American Petroleum Institute
13.	APL	Accepted Products Listing
~~13 ARA~~		~~American Railway Association~~
~~14. AREA~~		~~American Railway Engineering Association~~
14.	AREMA	American Railway Engineering and Maintenance-of-Way Association
15.	ASCE	American Society of Civil Engineers
16.	ASLA	American Society of Landscape Architects
17.	ASTM	American Society for Testing and Materials
18.	ATMS	Advanced Traffic Management System

19.	AWPA	American Wood Preservers' Association
20.	AWWA	American Water Works Association
21.	AWS	American Welding Society
22.	~~CRF~~CFR	Code of Federal Regulations
23.	CSI	Construction Specification Institute
24.	EBS	UDOT's Electronic Bid System
25.	EUSERC	Electric Utility Service Equipment Requirements Committee
26.	FHWA	Federal Highway Administration
27.	FSS	Federal Specifications and Standards
28.	GSA	General Services Administration
29.	IMSA	International Municipal Signal Association
30.	ISO	International Organization for Standardization
31.	ITE	Institute of Traffic Engineers
32.	MIL	Military Specifications
33.	MUTCD	Manual on Uniform Traffic Control Devices
34.	NEMA	National Electrical Manufacturers Association
~~34.~~	~~NVLAP~~	~~National Verification Laboratory Acceptance Program, (Bureau of Standards)~~
35.	OSHA	Occupational Safety and Health Administration
36.	PCA	Portland Cement Association
37.	PDPL	Performance Data Products Listing
38.	PTI	Post-Tensioning Institute
39.	SAE	Society of Automotive Engineers
40.	SSPC	~~Structural Steel Painting Council~~The Society for Protective Coatings
41.	~~WP3~~SWPPP	Storm Water Pollution Prevention Plan
42.	~~U.L.~~UL	Underwriter's Laboratory
43.	UDOT	Utah Department of Transportation
44.	UPDES	Utah Pollution Discharge Elimination System
45.	USC	United States Code
~~44.~~	~~USAS~~	~~United States of American Standard Institute~~
46.	WWPA	Western Wood Products Association

1.3 TERMS

A. Interpret terms used in the Contract as follows:~~Wherever the following terms are used in the Contract, they mean:~~

1. **Act~~s~~ of God:** ~~Earthquake, tidal wave, tornado, hurricane, or a~~Any ~~other~~ cataclysmic phenomenon of nature beyond the Department's and Contractor's control ~~that causes loss, damage, or injury to the work~~. Weather is not considered an ~~"A~~act of God~~"~~ unless it can be shown conclusively that such weather could not have been anticipated as a normal hazard of the contract.

2. **Actual Cost:** Contractor's actual cost to provide labor, material, equipment owned or invoiced rental, and administrative overhead necessary for the work. Excludes profit.

3. **Addendum:** ~~Change in bid proposals during time of advertisement~~Contract revision developed between advertising and opening bids.

4. **Advertisement:** The public announcement ~~inviting~~ requesting bids for specified work ~~to be performed~~ or materials ~~to be furnished~~.

5. **Award:** The Department's acceptance of a bid or ~~P~~proposal. ~~or Statement of Qualifications by the Department resulting in a Contract for work between the Department and the Contractor.~~

6. **Backfill:** Material used to replace, or the act of replacing material removed during construction.

7. **Bid:** Bid proposal. A bidder's written offer or proposal on Department furnished forms to perform stated work at the quoted prices.

8. **Bid Documentation:** All writings, working papers, computer printouts, charts, and data compilations containing or reflecting a bidder's information, data, or calculations used to determine the bid proposal. Bid documentation includes material used to decide and apply:

   Equipment rates
   Overhead rates
   Labor rates
   Efficiency or productivity factors
   Arithmetic extensions
   Subcontractor and material supplier quotations

   Reference all manuals used to determine the bid proposal, including name, date, and publisher. Bid documentation excludes any Department documents provided to the bidder used to prepare the bid proposal.

9. **Bid Documentation Escrow:** Preserving successful bid documentation to be used in the event of a claim or litigation between the bidder and the Department.

10. **Bidder:** An~~y~~ individual or legal entity submitting a ~~Proposal~~ bid or ~~Statement of Qualifications in~~ response to ~~the~~ a Department~~'s~~' request for proposals.

~~7. **Bid Proposal:** The prescribed form on which the bidder's financial offer is submitted.~~

11. **Bid Guaranty:** The security furnished with a bid to assure that the bidder will enter into the contract if the bid is accepted.

12. **Bridge:** A structure, including supports, erected over a depression or an obstruction such as water, highway, or railway, and having:

    a. A track or passageway for carrying traffic or other moving loads~~,~~ or utilities

    b. A length measured along the center of roadway of more than 20 ft between undercopings of abutments or extreme ends of openings for multiple boxes.

13. **Bridge Length:** The over-all length of a bridge measured along the line of survey stationing back to back of the back-walls of abutments, if present, otherwise end to end of the bridge floor.~~,~~ ~~but i~~In no case is the bridge length less than the total clear opening of the structure.
    a. **Bridge Roadway Width**: The clear width measured at right angles to the longitudinal centerline of the bridge between the bottom of curbs or in the case of multiple height of curbs, between the bottoms of the lower risers or if curbs are not used, between inner faces of parapet or railing.
14. **Certification:** A written document or affidavit officially declaring confirmation of a statement or information as being true, accurate, or genuine.
15. **Calendar Day:** Every day shown on the calendar, beginning and ending at midnight.
16. **Certificate of Compliance:** A certification, including a signature by a person having legal authority to act for the manufacturer, stating that the product or assembly to be incorporated into the project was fabricated in accordance with and meets the applicable specifications. ~~A document containing a certified statement from the manufacturer concerning the quality and quantity of material delivered.~~
17. **Certified Test Report:** A test report from the manufacturer or an independent testing laboratory, including a signature by a person having legal authority to act for the manufacturer or the independent testing laboratory stating that the test results show the product or assembly to be incorporated into the project has been sampled and tested and the samples have passed all specified tests.
18. **Change Order:** A written order to the Contractor ~~covering contingencies~~detailing changes to the specified work quantities, extra work, ~~increases or decreases in contract quantities resulting in significant changes to the character of the work, and additions~~ or ~~alterations~~ modification to the original ~~C~~contract which establishes the basis of payment and time adjustments for the affected changes.
19. **Claims Review Board:** A board established by UDOT policy to hear and review Contractor claims not settled or resolved at the Department's District or Region level. The board makes recommendations to the Department's Deputy Director for settlement.
20. **Commercial ~~Plant~~Materials Source:** A commercial materials source site or materials plant that sells ~~material~~ to the general public before the Department's advertisement of the ~~C~~contract, whose continuance in operation is determined wholly without regard to a particular Federal or Federally assisted contract, and possesses the required retail sales tax license and business license in its residential State.
21. **Commission:** The Utah Transportation Commission.
22. **Completion Date:** The date when the ~~C~~contract work is specified to be ~~S~~substantially ~~C~~complete.

23. **Concrete - Small Structure:** ~~8~~ Eight cubic yards or less of concrete.

24. **Conformity:** Conformance. Compliance with reasonable and customary manufacturing and construction tolerances where working tolerances are not specified. Where working tolerances are specified, conformity means compliance with such tolerances.

25. **Construction Limits:** Area of established boundaries within the highway right-of-way or construction easements that defines the construction area.

26. **Contract:** ~~The w~~Written agreement between the Department and the Contractor establishing the obligations of the parties for the performance of the work prescribed. The ~~C~~contract includes the following, all of which constitute one instrument:
    a. Invitation for ~~B~~bids
    b. Bid ~~P~~proposal
    c. Contract ~~B~~bond
    d. Specifications
    e. Special ~~P~~provisions
    f. General and detailed plans
    g. Notice of award
    h. Notice to proceed
    i. Authorized contract time extensions~~.~~
    j. Any change orders and agreements ~~that are~~ required to complete the ~~construction of the~~ work in an acceptable manner

27. **Contract Amount (Price component):** ~~-~~ The summation of the products of the quantities shown in the bid schedule multiplied by the unit bid prices for the items in the Contractor's bid~~Bid Proposal~~, but not including Time.

28. **Contract Bid Item:** A specific unit of work for which a price is provided in the contract. For projects that include Price + Time (P+T) bidding, Time is a bid item.

29. **Contract Bond~~s~~:** The approved form of security, executed by the Contractor and the Contractor's ~~S~~surety or ~~S~~sureties, guaranteeing complete execution of the ~~C~~contract~~, and all pertinent~~ including change orders~~,~~ and the payment of all legal debts pertaining to the construction of the project.
    a. **Contract Payment Bond:** The security executed by the Contractor and furnished to the Department to guarantee payment of all Contractor legal debts ~~of the Contractor~~ pertaining to the construction of the ~~C~~contract.
    b. **Contract Performance Bond:** The security executed by the Contractor and furnished to the Department to guarantee completion of the work under the ~~C~~contract.

30. **Contract Completion:** ~~–~~ ~~t~~The day, determined by the Engineer, when all work specified in the contract is completed and all obligations of the Contractor under the contract are fulfilled. Furnish all documentation required by the contract and required by law before this date.

31. **Contract Pay Item:** A specific unit of work for which a price is provided in the contract and paid, subject to contract provisions, to the Contractor for the accepted quantities. Exceptions ~~to this~~ include, but are not limited to, the items Time, and Lane Rental, which are not pay items. No payment will be made for the bid items titled Time and Lane Rental.

~~24. **Contract Payment Bond:** The security executed by the Contractor and furnished to the Department to guarantee payment of all legal debts of the Contractor pertaining to the construction of the Contract.~~

~~25. **Contract Performance Bond:** The security executed by the Contractor and furnished to the Department to guarantee completion of the work under the Contract.~~

32. **Contract Time:** The date, ~~The~~ or number of working days or calendar days allowed for ~~S~~substantial ~~C~~completion of the ~~C~~contract, including authorized time extensions. When a ~~C~~completion ~~D~~date is specified, ~~achieve~~reach ~~S~~substantial ~~C~~completion on or before that date, even when that date is a Saturday, Sunday or holiday.

33. **Contractor:** The individual or legal entity contracting with the Department for performance of prescribed work.

34. **Contractor Affiliate:** Any person associated ~~therewith~~ with the Contractor in the capacity of owner, partner, director, officer, principal investigator, project director, manager, ~~or~~ auditor, or other like position.

35. **County:** ~~t~~The County where the contracted work is located.

36. **Culvert:** Any structure that provides an opening under the roadway not meeting the classification of a bridge as defined in this ~~S~~section.

37. **Debarment:** Action taken by the Department or ~~F~~federal ~~G~~government pursuant to regulations that prohibits a person or company from performing work on a public project.

38. **Delay:** Any event, action, or factor causing work to extend beyond the specified contract time.

    a. Excusable Delay: A delay ~~resulting from an unforeseeable event and caused by circumstances~~ beyond the Contractor's control and not caused by the Contractor's fault or negligence and for which a time extension may be granted.

        1) Compensable Delay: An excusable delay caused by Department action or inaction, or under the Department's control, including delays resulting from change orders, differing site conditions, work suspensions caused by conditions beyond the control of the Contractor, lack of site access, and delayed shop drawing approval. For such delays, the Department may grant additional time and compensation.

        2) Noncompensable Delay: An unforeseen and unanticipated excusable delay caused by acts of God, acts of public enemies, fires, floods, epidemics, quarantine restrictions, area wide strikes, freight embargoes, unusually severe

weather, or delays not caused by the Contractor's or the Department's fault or negligence. For such delays, additional compensation will not be granted.

a) Concurrent Delay: A noncompensable delay that occurs when both the Contractor and the Department independently delay work on critical path activities during approximately the same time period.

b. Nonexcusable Delay: A delay that was within the Contractor's control, was the fault or responsibility of the Contractor, or could have reasonably been foreseen by the Contractor and for which there is no monetary compensation or time extension. Examples of such delay-causing events are normal weather or the failure by the Contractor to assign sufficient resources to the work.

39. **Department:** The Utah Department of Transportation

40. **Differing Site Conditions:** Subsurface or latent physical conditions at the project site that:
    a. Differ significantly from those indicated in the contract, or
    b. Present unknown physical conditions of an unusual nature that differ materially from those normally encountered and generally recognized as inherent in the nature of the required work.

41. **Electronic Communication:** A communication transmitted through facsimile (fax), e-mail, or other electronic means where a hard copy can be produced.

42. **Engineer:** The UDOT Deputy Director ~~of the Department~~, acting directly or through a duly authorized representative, ~~(~~usually the Resident Engineer or Consultant Engineer~~)~~, ~~who is~~ responsible for engineering and administrative ~~supervision~~ of ~~construction covered by~~ the ~~C~~contract. A Consultant Engineer ~~who is~~ hired by the Department for ~~C~~construction ~~P~~project ~~M~~management is considered an extension of the Department and has the same responsibility and authority as a Resident Engineer.

43. **Equipment:** All machinery, tools, apparatus, and the fuels, lubricants, batteries, and other supplies and parts needed to use, operate, and maintain these items for use in constructing and completing the work. ~~necessary for the upkeep, maintenance, construction, and completion of the Contract.~~

44. **Extra Work:** Work not provided for in the ~~C~~contract, but found by the Engineer to be essential for the satisfactory completion of the ~~C~~contract within its intended scope.

45. **Final Acceptance:** The date when the Engineer determines that all requirements of physical completion, as defined in this section, are satisfactorily completed.

46. **Force Account ~~Work~~:** ~~Work performed as directed by the Engineer and paid for on the basis of actual costs and appropriate additives provided in the contract.~~A method of payment for work performed by the Contractor at the Engineer's direction, calculated as specified in Section 01282.

47. **Geotextile:** Any permeable knitted, woven, or nonwoven textile material used with foundation, soil, rock, earth, or any other geotechnical engineering related material, as an integral part of a man-made project, structure, or system. ~~Geotextile generally refers to knitted, woven, and non-woven fabrics.~~

48. **Highway, Street, or Road:** A general term denoting a public way used by vehicles and pedestrians, ~~for purposes of travel,~~ including the entire area within the right-of-way.

49. **Holidays:** ~~The following are considered holidays:~~

New Year's Day	Labor Day
Martin Luther King Day	Columbus Day
Presidents' Day	Veteran's Day
Memorial Day	Thanksgiving Day
Independence Day	Christmas Day
Pioneer Day	

When the Holiday falls on a Saturday, Friday will be the Holiday~~;~~. ~~w~~When the Holiday falls on Sunday, Monday will be the Holiday.

50. **Inspector:** The Engineer's authorized representative assigned to ~~make detailed inspections of contract performance~~inspect work and materials.

51. **Interpretations:** Unless otherwise stated in the ~~C~~contract, all direction, approvals, permissions or acceptance is by the Engineer.

52. **Invitation for Bids:** The ~~A~~advertisement ~~for~~ requesting bids ~~Proposals~~ for ~~all~~ work or materials ~~on which bids are requested~~. ~~Such advertisement indicates with reasonable accuracy~~ It estimates ~~the quantity~~quantities, ~~and~~ specifies the location of the work, ~~to be performed or the~~ character and quantity of the materials to be furnished and the time and place of the opening of ~~proposals~~bids.

53. **Laboratory:** The Department's testing laboratory ~~of the Department~~ or any other testing laboratory designated by the Engineer.

54. **Lane Rental:** A method to assess the Contractor ~~daily or hourly~~ rental fees for each lane, shoulder, or combination of lanes and shoulders taken out of service.

~~46. **Limits of Construction:** An area with established boundaries, identified within the highway right-of-way or construction easements, where the Contractor's use for construction purposes is permitted. The limits of construction may also be referred to as the roadway.~~

55. **Liquidated Damages:** A predetermined sum ~~to be~~ assessed the Contractor. This sum is not considered ~~as~~ a penalty, but as liquidated damages due the Department by reason of inconvenience to the public, added cost of engineering and supervision, and other items for extra expenditures of public funds for the Contractor's failure to perform as specified.

56. **Major Contract Item:** Any individual bid item, or item added by change order, having a contract value in excess of ~~5~~ 10 percent of the original contract amount.

57. **Materials:** ~~Any s~~Substances specified for ~~incorporation into the completed~~use in project construction.

~~50. **Minor Contract Item:** Any bid item not meeting the definition of a Major Contract Item.~~

58. **Notice to Proceed:** Written notice to the Contractor to begin the ~~C~~contract.

59. **Overburden:** Any material that overlays material designated for road or bridge construction.

60. **Pavement Structure:** The combination of subbase, base course, and surface course placed on a subgrade to support and distribute the traffic load to the roadbed.
    a. **Surface Course:** One or more layers of a pavement structure designed to accommodate the traffic load, the top layer of which resists skidding, traffic abrasion, and the disintegrating effects of climate. The top layer is sometimes called the "Wearing Course."
    b. **Base Course**: One or more layers of specified material and thickness placed on a subbase or a subgrade to support a surface course.
    c. **Subbase**: ~~Layer(s)~~One or more layers of specified material thickness placed on a subgrade to support a base course.
    d. **Subgrade:** The top surface of a roadbed upon which the pavement structure, shoulders, and curbs are constructed.
    e. **Subgrade Treatment**: Stabilization of roadbed material.

61. **Physical Completion:** ~~-~~ Physically complete. ~~t~~The day~~, determined by the Engineer,~~ when all construction work required by, or incidental to, the contract ~~(including all punch list work, final cleanup, and demobilization)~~ is ~~physically~~ satisfactorily completed, including all punch list work, final cleanup, and demobilization; ~~and~~ the date determined by the Engineer when final acceptance is established and the Contractor's only outstanding obligation under the ~~C~~contract is ~~the submittal~~submitting or processing ~~of~~ documentation.

62. **Plan Quantity:** An estimated quantity for a portion of the work designated as the pay quantity for the contract. Refer to Section 01280.

63. **Plans:** Approved contract drawings showing the location, type, dimensions, and details of the ~~Contract to be performed~~specified work.
    a. **Standard ~~Plans~~Drawings**: Detailed drawings approved for repetitive use.
    b. **Working Drawings:** Supplemental design sheets or similar data that the Contractor is required to submit to the Engineer such as shop drawings, erection plans, falsework plans, framework plans, cofferdam plans, and bending diagrams for reinforcing steel.

64. **Prequalification/Initial Financial Screening Statement:** The specific forms on which required information is furnished about the Contractor's ability to perform and finance the work.

65. **Price + Time Bidding (P+T):** A ~~P~~price ~~- plus~~ plus-time bidding procedure.

66. **Profile Grade:** The trace of a vertical plane intersecting the top surface of the proposed wearing surface, usually along the longitudinal centerline of the roadbed. Profile grade means either elevation or gradient of such trace according to the context.

67. **Project:** The specific section of the highway or other specific property on which construction is to be performed together with all improvements to be constructed under the ~~C~~contract.

68. **Proposal:** A bidder's written response to a Department request for proposals.~~offer on Department furnished forms, to perform stated work at the quoted prices.~~ See also Value Engineering Change Proposal.

~~61. **Proposal Form:** The prescribed form on which the bidder's offer is submitted.~~

~~62. **Proposal Guaranty:** The security furnished with a proposal to assure that the bidder will enter into the Contract if the Proposal is accepted.~~

69. **Responsible Bidder:** A bidder able to perform the specified work as determined by the Department ~~to possess the ability to perform the Contract work~~.

70. **Responsive Bid:** A bid that meets all requirements of the invitation for bids.

71. **Resources:** The labor, equipment, materials, and incidentals necessary to perform work on a contract bid item or other element of work.

72. **Right-of-Way:** A general term denoting land, property, or interest acquired for or devoted to transportation purposes.

73. **Roadbed:** The graded portion of highway within top and side slopes, prepared as a foundation for the pavement structure and shoulders.

74. **Roadbed Material:** Material in cuts, embankments, and ~~in~~ embankment foundations from the subgrade down that supports the pavement structure.

75. **Roadside:** The areas between the outside edges of the shoulders and the right-of-way boundaries including unpaved median areas between inside shoulders of divided highways and areas within interchanges.

76. **Roadside Development:** Items necessary for the preservation or replacement of landscape materials. Features may include suitable plantings and other improvements or ground cover to preserve and enhance the appearance and stability of the highway right-of-way or acquired easements for scenic improvements.

77. **Roadway:** The portion of a highway within ~~limits of~~the construction limits.

78. **Shoulder:** The portion of the roadway adjacent to the traveled way where vehicles may stop for emergencies~~,~~ and which supports base and/or surface courses.

79. **Sidewalk:** That portion of the roadway constructed exclusively for pedestrian use.

80. **Significant Change in Character of Work:** Work that differs materially in kind or nature from that involved or included in the original contract or results in the total quantity of a major contract item, as defined in this section, varying from the original contract quantity by more than 25 percent.

81. **Site of Work:** As defined in Title 29 CFR Part 5.2 (1).

~~a. The physical place or places where the construction called for in the Contract remain(s) when the work is completed and any other site where a significant portion of the building or work is constructed, provided that such site is established specifically for the performance of the contract or project.~~

~~b. The adjacent nearby property used by the Contractor or subcontractor in such construction.~~

~~c. Fabrication plants, mobile factories, batch plants, borrow pits, job headquarters, tool yards, etc., provided they are dedicated exclusively, or nearly so, to the performance of the Contract and are adjacent or virtually adjacent to the actual construction location such that it would be reasonable to include them, except as noted in the following exclusions.~~

~~d. Exclusions:~~

~~1) The **permanent** home offices, branch plants, fabrication plants, and tool yards of a Contractor or subcontractor whose location and continuance in operation is determined wholly without regard to a particular Federal or Federally assisted contract.~~

~~2) Fabrication plants, borrow pits, job headquarters, etc., of a commercial supplier or materialman that are established by the supplier of the materials for the project before opening of bids and not on the project site.~~

82. **Specifications:** The compilation of provisions and requirements for the performance of prescribed work.

a. **Special Provisions**: A unique specification or a modification or revision to the standard specifications applicable to an individual contract.

b. **Supplemental Specifications**: Approved additions and revisions to the Standard Specifications.

c. **Standard Specifications**: Specifications approved for general application and repetitive use.

83. **Specifications Format:** See the Specification Writer's Guide. Refer to: http://www.udot.utah.gov/index.php/m=c/tid=719~~The layout of each specification is as follows:~~

~~SECTION NUMBER~~

~~TITLE~~

~~PART (One, Two, and Three)~~
~~ARTICLE (For example, 1.1, 1.2, 2.1, 2.2, 3.1, and 3.2)~~
~~Paragraph (For example, A, B, C under an article)~~

~~Example:~~
~~PART 1 GENERAL~~
~~1.1 ARTICLE (First level)~~
~~A. Paragraph (Second level)~~
~~1.Subparagraph (Third level)~~
~~a. Subparagraph (Fourth level)~~
~~1) Subparagraph (Fifth level)~~

The titles or headings of the ~~S~~sections, ~~P~~parts, ~~A~~articles, paragraphs, and sub-paragraphs in Standard Specifications and Special Provisions are intended for convenience of reference and have no bearing on their interpretation.

84. **Stabilization:** Modification of soils or aggregates by incorporating materials that increases load-bearing capacity, firmness, and resistance to weathering or displacement.

85. **State:** The State of Utah acting through its authorized representative.

86. **Structures:** Bridges, culverts, catch basins, drop inlets, retaining walls, cribbing, manholes, endwalls, buildings, sewers, service pipes, underdrains, foundation drains, and other such features that may be encountered in the work.

87. **Subcontractor:** An individual or legal entity ~~that performs part of the Contractor's required work through a contract agreement with the Contractor~~to which a Contractor sublets part of the work.

88. **Substantial Completion:** ~~-~~ Substantially complete. ~~t~~The day, determined by the Engineer, when all of the following have occurred:
    a. The public, ~~(~~including vehicles and pedestrians~~)~~ , has full and unrestricted use and benefit of the facilities both from the operational and safety standpoint~~, and~~.
    b. All safety features are installed and fully functional, including, but not limited to, illumination, signing, striping, barrier, guard~~-~~rail, impact attenuators, delineators, and all other safety appurtenances~~, and~~,
    c. Only minor incidental work, replacement of temporary substitute facilities or correction or repair remains for ~~the P~~physical ~~C~~completion ~~of the contract, and~~.
    d. The Contractor and Engineer mutually agree that all work remaining will be performed without lane closures, trail/sidewalk closures, or further delays, disruption, or impediment to the public.

89. **Substructure:** All of the structure below the girders or main load carrying members of simple and continuous span~~s~~ bridges, including abutments, bent caps, columns, bents, footings, wingwalls, and skewbacks

of arches~~, skewbacks of arches and tops of footings or rigid frames; including backwalls, wingwalls and wing protection railings~~.

90. **Superintendent:** The Contractor's authorized ~~representative~~ employee in responsible charge of the work.

91. **Superstructure:** All ~~that part~~ of ~~a~~ the structure except the substructure as defined in this ~~S~~section.

92. **Surety:** The legal entity or individual, other than the Contractor, executing a bond furnished by the Contractor.

93. **Time Related Cost (Time component):** ~~-~~ A lump sum bid item titled "Time" for which there is no pay. The sum of the products of the daily time-related cost~~-~~ rates multiplied by the number of ~~calendar~~ days estimated by the Contractor to achieve the milestones specified.

94. **Town, City, or District:** A subdivision of the county used to designate or identify the location of the ~~C~~contract.

95. **Traveled Way:** The portion of the roadway designated for the movement of vehicles, excluding shoulders and auxiliary lanes.

96. **Unbalanced Bid:**

    a. **Mathematically Unbalanced**: A bid containing lump sum or unit bid items that do not ~~reflect~~ include reasonable actual costs plus a reasonable proportionate share of the bidder's anticipated profit, overhead costs, and other indirect costs.

    b. **Materially Unbalanced**: A mathematically unbalanced bid that generates a reasonable doubt that awarding the ~~C~~contract to the bidder will result in the lowest ultimate cost to the Department.

97. **Unrestricted Traffic**: No traffic control measures in use that obstruct, delay, or in any way impede traffic flow, other than those specifically permitted in the contract.

98. **Utility:** All privately, publicly, or cooperatively owned lines, facilities, and systems for producing, transmitting, or distributing communications, power, heat, gas, oil, water, waste, storm water not connected with the highway drainage, signal systems, and other products that directly or indirectly serve the public. ~~t~~The utility company.

99. **Value Engineering Change Proposal:** A change proposed by the Contractor and considered by the Department intended to result in a cost savings to the project without reducing the essential functions and characteristics of the project. Refer to Section 00725.

100. **Work:** All labor, materials, equipment, documents, elements, activities, and ~~other~~ incidentals necessary to complete the ~~C~~contract, including all alterations, amendments, or extensions made by change order or other written orders of the Engineer.

101. **Working Day:** Any calendar day, except:

    a. Saturdays, Sundays, and contract-designated ~~H~~holidays.

    b. Days between December 1 and February 29, inclusive.

c. Days when the Contractor is specifically required by the ~~C~~contract or letter from the Engineer to suspend operations through no fault of the Contractor.

d. Days when the Engineer determines that inclement weather or adverse conditions interfere with the progress of the work.

1) When the Engineer determines that inclement weather prevents the Contractor from working with at least 75 percent of the normal labor and equipment force engaged in the work for at least ~~75~~ 60 percent of the normal working day.

2) When inclement weather stops the Contractor from beginning work at the normal starting hour~~,~~ and the crew is released as a result, it is not considered a working day even though conditions may improve and the major portion of the day could be considered suitable for operations.

102. **Working Drawings:** See "Plans."

103. **Written Permission of the Engineer**: A letter signed by the Engineer granting specific permission and outlining limitations of the permission.

PART 2 PRODUCTS Not used

PART 3 EXECUTION Not used

END OF SECTION

Supplemental Specification
2005 Standard Specification Book

SECTION 00725

SCOPE OF WORK

Delete Section 00725 in its entirety and replace with the following:

PART 1 GENERAL

1.1 RELATED SECTIONS

A. Section 00555: Prosecution and Progress

B. Section 00570: Definitions

C. Section 00727: Control of Work

D. Section 01282: Payment

~~B~~E. Section 01355: Environmental Protection

F. Section 01554: Traffic Control

~~C~~G. Section 01741: Final Cleanup

1.2 REFERENCES

~~A.Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)~~

A. UDOT and Utah AGC Partnering Field Guide

1.3 CONTRACT INTENT ~~OF CONTRACT~~

A. ~~Furnish all resources and incidentals required to complete the specified work.~~The contract states the roles and obligations of the Department and Contractor regarding the construction, execution, and completion of work.
   1. Furnish all resources and incidentals required to complete the specified work.

1.4 PARTNERING

~~A. Partnering does not change the legal relationship of the parties to the Contract, and does not relieve either party from any of the terms of the Contract.~~

~~B~~A. The Department encourages ~~the formation of a strong~~ partnership ~~among~~ between the Department, the Contractor, and the ~~Contractor's principal~~ subcontractors. This partnership ~~draws on~~uses the strengths of each organization to identify and achieve mutual goals.

~~C~~B. Implement partnering in accordance with the UDOT~~'s~~ and Utah AGC Partnering Field Guide. Refer to: ~~http://www.udot.utah.gov/index.php/m=c/tid=719~~ http://www.udot.utah.gov/index.php/m=c/tid=1290.

1. ~~Determine~~Decide ~~jointly between the Contractor and~~with the Engineer whether to ~~either~~ use an independent third party firm to implement facilitated partnering or to ~~jointly~~ share in ~~those responsibilities~~facilitation. ~~Determine jointly between the Contractor and Engineer a facilitator for the meeting and determine attendees, agenda, duration, and location of a partnering workshop.~~
   a. Contact the Engineer within 30 days of Notice of Award and before the preconstruction conference to implement a third party facilitated partnering initiative.
2. ~~Contact the Engineer within 30 days of Notice of Award and before the Preconstruction Conference to implement a third party facilitated partnering initiative.~~ The Contractor and Engineer select a facilitator for the meeting and develop attendees list, agenda, duration, and location of a partnering workshop.

~~D~~C. ~~Both the Department and the Contractor agree to, and s~~Share any costs equally with the Department ~~any costs~~ to accomplish partnering.

~~E. Use UDOT's Partnering Field Guide to determine workshop attendance. Refer to http://www.udot.utah.gov/index.php/m=c/tid=719.~~

~~F~~D. Follow-up workshops may be held ~~periodically~~ as agreed by the Contractor and the ~~Department~~Engineer.

1.5 DIFFERING SITE CONDITIONS, CHANGES, AND ~~EXTRA WORK~~REQUESTS OR CLAIMS FOR ADDITIONAL COMPENSATION

A. ~~Promptly~~ Immediately notify the Engineer ~~in writing~~ verbally of alleged changes to the ~~C~~contract due to differing site conditions, extra work, altered work beyond the scope of the ~~C~~contract, ~~or~~ actions taken by the Department that change the

~~C~~contract terms and conditions, or upon discovering any other unforeseen condition or event that may result in a request or claim for additional compensation or time. ~~Conditions to report include:~~

~~1. Conditions differing materially from those indicated in the Contract.~~

~~2. Unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent to the work provided for in the Contract.~~

1. Refer to Section 00555 for determining compensation and contract time extension for excusable delays.
2. When encountering differing site conditions on the project, leave the site undisturbed and suspend work unless directed otherwise.
3. Obtain written authorization from the Engineer to perform affected work and incur contract item expense after discovering the change, condition, or event.

B. Notification Requirements:

1. Provide the following information in writing within seven calendar days of when the change, condition, or event resulting in the request or claim for additional compensation is noticed.
   a. Date, nature, and circumstances causing the change, condition, or event.
   b. Name, title, and activity of each Department representative aware of the change, condition, or event.
   c. Identify documents and the substance of discussions about the change, condition, or event.
   d. Basis for a claim that the work is not required by the contract.
   e. Particular elements of contract performance for which compensation is being requested including:
      1) Pay items that have been or may be affected by the change, condition, or event.
      2) Labor or materials that will be added, deleted, or wasted by the change, condition, or event, and equipment that will be idled or added.
      3) Existing or anticipated delays and disruptions in contract performance, procedure, or order.
      4) Estimate of the time within which the Department must respond to the notice to reduce project cost, delay, or disruption.
2. Failure to provide written notification within seven calendar days of when the change, condition, or event is noticed will limit any contract adjustment, when warranted, to those costs or impacts incurred after written notification is received by the Engineer.
3. Failure to provide required notice under this article constitutes a waiver for any claim resulting from the alleged change, condition, or event.

C. After notifying the Engineer, continue the work unaffected by the alleged differing site conditions, change, condition, or event, to the extent possible under the contract.

1. The Engineer will provide a written response within seven calendar days of receiving the notice to do one of the following:

a. Confirm the change, condition, or event and, when necessary, direct how the work will proceed.

b. Deny the change, condition, or event, and direct how the work will proceed.

c. Advise that there is not enough information to decide whether to confirm or deny the change, condition, or event and indicate what additional information is necessary for further review and the date by when it must be received. The Engineer responds to additional information within seven calendar days of receipt.

1) Any contract adjustments will exclude increased costs or time extensions resulting from the Contractor's failure to provide the requested information.

D. Contract adjustment is made as written modification to the contract through change order when warranted, unless the Contractor does not notify the Engineer in accordance with this article.

1. Loss of anticipated profits are excluded.

E. No contract adjustment that benefits the Contractor is allowed unless the Contractor has provided written notice in accordance with this article.

F. If the Engineer decides a contract adjustment identified by the Contractor is unnecessary and the Contractor does not agree with the Engineer's decision, the Contractor may pursue a claim for additional compensation or contract adjustment as specified in Section 00727.

~~B. Do not perform further work or incur further contract item expense relating to the claimed change after the date the change allegedly occurred, unless directed otherwise in writing by the Engineer.~~

~~C. Immediately notify the Engineer verbally of the alleged change or extra work occasioned by differing site conditions or actions by the Department. Provide the following applicable information to the Engineer in writing within five calendar days of the date the change or action was noted:~~

~~1. The date of occurrence and the nature and circumstances of the occurrence that constitute a change.~~

~~2. Name, title, and activity of each Department representative knowledgeable of the claimed change.~~

~~3. Identity of any documents and the substance of any oral communication involved in the claimed change.~~

4. Basis for a claim of accelerated schedule performance, if applicable.
5. Basis for a claim that the work is not required by the Contract, if applicable.
6. Failure to provide the required notice constitutes a waiver of any and all claims that may arise as a result of the alleged change. Department does not allow adjustments to the Contract that benefit the Contractor unless the Contractor has provided the required written notice.

D. Particular elements of contract performance for which additional compensation may be sought include:
1. Pay items that have been or may be affected by the claimed change.
2. Labor or materials, or both, that are added, deleted or wasted by the claimed change and what equipment is idled or required.
3. Delay and disruption in the manner and sequence of performance that has been or will be caused.
4. Adjustments to contract prices, delivery schedules, staging, and contract time estimated due to the claimed change.
5. Estimate of the time within which the Department must respond to the notice to minimize cost, delay, or disruption of performance.

E. After notifying the Engineer, and in the absence of directions received to the contrary from an authorized representative of the Department, continue diligent prosecution of the work under the Contract to the maximum extent possible under the contract provisions.

F. Within 10 calendar days after receipt of notice, the Engineer responds in writing to the Contractor to:
1. Confirm that a change occurred and, when necessary, direct the method and manner of further performance, or
2. Deny that a change occurred and, when necessary, direct the method and manner of further performance, or
3. Advise the Contractor that information necessary for deciding to confirm or deny the change has not been submitted, and indicate what information is needed for further review and date by which the Contractor should submit it to the Engineer. The Engineer responds to such additional information within 10 calendar days of receipt from the Contractor.
4. Modify the Contract in writing accordingly.

G. Any adjustments made to the Contract do not include increased compensation or time extensions for delay resulting from the Contractor's failure to provide additional information requested by the Engineer.

1.6 VARIATION IN QUANTITIES AND SIGNIFICANT CHANGES IN THE CHARACTER OF WORK

A. The Engineer reserves the right at any time during the work to revise the contract and make written changes in quantities and alterations in the work that are necessary to satisfactorily complete the project.

~~B~~1. Such changes in quantities and alterations do not invalidate the ~~C~~contract or release the surety~~,~~ and the Contractor agrees to ~~perform~~ complete the work as altered.

2. Do not proceed with the revised work without the Engineer's written authorization.

3. Upon receiving written approval, proceed immediately with the revised work.

B. Meet notification requirements under this section, article 1.5, when requesting compensation or adjustment to the contract under this article.

1. No contract adjustment that benefits the Contractor is allowed unless the Contractor has provided written notice in accordance with this section.

C. Payment will be made at contract prices when the total quantity of any item of work varies from the bid quantity by 25 percent or less.

D. Payment will be made at the contract prices when the total quantity of any item of work varies from the bid quantity by more than 25 percent and the alterations or changes in quantities do not represent a significant change in character of work to be performed under the contract.

E. The term "significant change in character of work" applies only to the following circumstances:

1. ~~When t~~The character of the altered work differs materially in kind or nature from that involved or included in the original ~~proposed construction~~contract~~, or~~.

2. The total quantity of a major contract item, as defined by Section 00570, varies from the original contract quantity by more than 25 percent.~~When a major item of work, as defined elsewhere in the Contract, is increased in excess of 125 percent or decreased below 75 percent of the original contract quantity.~~

   a. An adjustment in price may be made to the contract at the request of either party.

   b. Any adjustment for an increase in quantity applies only to that portion in excess of 125 percent of the original contract quantity.

      1) When the original contract price includes fixed costs, such costs are deemed recovered by payment made for 125 percent of the contract quantity and excluded from any adjustment to that portion in excess of 125 percent of the original contract quantity.

   ~~b. When a major item of work is decreased below 75 percent of the estimated quantity, the Department pays actual costs up to a~~

~~maximum amount equal to the dollar value of 75 percent of the estimated quantity at the Contract unit price. The Department does not allow for any other compensation resulting from work decreased below 75 percent of the estimated quantity.~~

c. Any adjustment for a decrease in quantity below 75 percent of the contract quantity is limited to the actual quantity of work performed.

1) When the original contract price includes fixed costs, such costs may be considered when establishing the adjustment.

2) Payment for the work will in no case exceed the payment that would have been made for the performance of 75 percent of the original item quantity at the contract price.

~~3. When a minor item of work, as defined elsewhere in the Contract, is increased in excess of 150 percent or decreased below 50 percent of the original contract quantity.~~

~~a. Any adjustment for an increase in quantity applies only to that portion in excess of 150 percent of the original contract quantity.~~

~~b. When a minor item of work is decreased below 50 percent of the estimated quantity, the Department pays actual costs up to a maximum amount equal to the dollar value of 50 percent of the estimated quantity at the Contract unit price. The Department does not allow for any other compensation resulting from work decreased below 50 percent of the estimated quantity.~~

~~4. Adjustments may be either for or against the Contractor in such an amount the Engineer may determine to be fair and equitable.~~

~~C~~F. The Department adjusts the ~~C~~contract, excluding loss of anticipated profits, if the alterations or changes in quantities ~~significantly~~ result in a significant change in ~~the~~ character of ~~the~~ work under the ~~C~~contract.

1. Such alterations or changes can be ~~in themselves~~ significant changes to the character of ~~the~~ work~~,~~ or by their effect~~, can~~ cause other work to become significantly different in character.

2. Agree upon the basis for ~~C~~contract adjustment before beginning work.

a. ~~If a basis cannot be agreed upon, t~~The Engineer may order the work to proceed under the ~~F~~force ~~A~~account provisions of Section 01282 if a basis for adjustment cannot be agreed upon.

~~2~~3. Contract time is adjusted in accordance with Section 00555 for directed changes that require additional time to complete.

4. Adjustments may be either for or against the Contractor in such an amount the Engineer may determine to be fair and equitable.

~~D. If the alterations or changes in quantities do not significantly change the character of the work to be performed under the Contract, the Department pays for the altered work as provided elsewhere in the Contract.~~

G. If the Engineer decides a contract adjustment identified by the Contractor is unnecessary and the Contractor does not agree with the Engineer's decision, the Contractor may pursue a claim for additional compensation or contract adjustment as specified in Section 00727.

1.7 SUSPENSIONS OF WORK ORDERED BY THE ENGINEER

A. ~~If the Engineer suspends or delays in writing the performance of all or any portion of the work for an unreasonable period of time (not originally anticipated, customary, or inherent to the construction industry), and the Contractor believes that additional compensation or contract time or both are due as a result of such suspension or delay, submit to the Engineer a written request for adjustment within seven calendar days of receipt of the notice to resume work. Explain in the request the reasons and support for such adjustment.~~The Engineer may give written notice to suspend all or any portion of the work for any reason at any time during the contract.

1. Submit a written request to the Engineer for a contract adjustment for suspensions or delays considered unreasonable or atypical to the construction industry. Refer to Section 00555.
   a. Submit the request within seven calendar days of the notice to resume work.
   b. Contract adjustment is made only for requests submitted within the established time frame.
2. The Department does not allow adjustments to the Contract to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided for or excluded under any other contract term or condition.
3. Contract adjustment is made in accordance with Sections 00555 and 01282 if both parties agree that the suspension:
   a. Increased the cost or time required for the performance of the contract.
   b. Resulted from conditions beyond the control of and not the fault of the Contractor, its suppliers, or subcontractors at any approved tier.
   c. Was not caused by weather.

B. If the Engineer decides a contract adjustment due to the suspension of work is unnecessary, and the Contractor does not agree with the Engineer's decision, the Contractor may pursue a claim for additional compensation or contract adjustment as specified in Section 00727.

~~B. Upon receipt of request, the Engineer:~~

~~1. Evaluates the request.~~

~~2. Adjusts (excluding profit) and modifies the Contract in writing accordingly, if the Engineer agrees that:~~

a. The suspension increased the cost and/or time required for the performance of the Contract.
b. The suspension was caused by conditions beyond the control of and not the fault of the Contractor, its suppliers, or subcontractors at any approved tier.
c. The suspension was not caused by weather.

C. The Engineer notifies the Contractor of whether or not an adjustment of the Contract is warranted.

D. Department does not allow adjustment to the Contract unless the Contractor has submitted the request for adjustment within seven calendar days of receipt of the notice to resume work.

E. Department does not allow adjustments to the Contract to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided for or excluded under any other term or condition of this Contract.

1.8 MAINTAINING TRAFFIC

A. Keep roads open to traffic during the work and work suspensions or provide and maintain detour roads as specified or directed.

2. 1. Provide traffic control in compliance with the current edition of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), the Traffic Control provisions of the Specifications, and the Traffic Control Plans.accordance with Section 01554.

2. Keep publicly and privately used roadways in a condition that safely and adequately accommodates traffic 24 hours a day and seven days a week. Maintain all necessary accesses to parking lots, garages, businesses, residences, farms, etc.

2 3. Exclude snow removal.

3. Maintain the sections of road undergoing improvement.

4. Failure to maintain traffic is cause for the Department to take action to meet the requirements of this specification. Department deducts its costs incurred in such action from money due the Contractor.

B. Snow removal is not required during periods of winter shutdown or when the Department suspends construction operations. The Department does not additionally compensate for maintenance except for specific work directed by the Engineer to benefit the traveling public.

C. Suspensions ordered by the Engineer: The Department maintains temporary roadways and portions of the project during work suspensions.

1. Prepare the project for traffic flow during anticipated work suspensions.

2. Maintain all required traffic control devices.
3. The Department maintains temporary roadways and portions of the project during work suspensions.
~~1~~4. Resume maintenance for the entire project once work ~~proceeds~~restarts.
~~2~~5. ~~Replace or restore any~~Repair or replace all work or materials lost or damaged ~~because of temporary use of the project~~during the suspension.
~~3~~6. Remove work or materials used for temporary maintenance~~,~~ and complete the project as though the work had been continuous and without interference.
~~4~~7. The Department pays for maintenance required for events beyond the Contractor's control during work suspensions at contract prices or as extra work.

D. Other Suspensions of Work:
1. Maintain the roadway at no additional cost to the Department to accommodate traffic during suspensions resulting from:
~~1.~~ a. Seasonal or climatic conditions.
~~2.~~ b. Failure to correct conditions unsafe for the workers or the general public.
~~3.~~ c. Failure to ~~carry out orders of~~perform work ordered by the Engineer.
~~4.~~ d. ~~Any o~~Other reasons caused by the Contractor.

E. Failure to maintain traffic is cause for the Department to take action to meet the requirements of this specification.
1. The Department deducts its costs incurred in such actions from money due the Contractor.

1.9 USE OF ON-SITE MATERIALS

A. Obtain approval before using excavated materials found on the work site that are suitable for completing other bid items of work. The Department pays for the quantity of excavated materials at the ~~C~~contract unit price for roadway excavation and under the pay item for which the material is used.
1. The Department does not charge for the materials used.
2. Obtain written approval before excavating material outside grading limits.

B. Replace excavated material used for completing other bid items of work with acceptable material at no additional cost to the Department.
~~1. Department does not charge for the materials used.~~
~~2. Obtain approval before excavating material outside grading limits but within the highway right-of-way.~~
~~3. Compact replacement material to the density requirements specified for roadway embankment construction.~~

C. ~~Structure materials designated for removal may be used temporarily in the work~~Unless otherwise specified in the contract, salvageable material is the property of the Contractor.

1.10 FINAL CLEANUP

A. Clean all rubbish, excess materials, temporary structures, and equipment from the highway, project, borrow and local material source sites, and all areas occupied in connection with the work ~~of all rubbish, excess materials, temporary structures, and equipment, etc.~~ before final inspection and acceptance.
1. Refer to Section 01741 for requirements.

1.11 RESTORATION OF SURFACES OPENED BY PERMIT

A. Allow individuals, firms or corporations with authorized permits to enter the project to construct or reconstruct any utility service.

B. When directed by the Engineer, ~~R~~repair damage caused by the permit holder~~when directed~~. The Department pays for repair work as extra work~~,~~ or as provided in the ~~C~~contract.

1.12 RAILWAY - HIGHWAY PROVISIONS

A. The Department arranges with the railway for new crossings or for existing crossings used during the work.

~~B. Obtain approval from the railway and pay for the use of crossings not specified in the Contract.~~

~~C. Avoid accidents, damage, unnecessary delay, or any interference with the movement of trains, traffic of the railway company, or other property.~~

~~D~~B. The Department does not reimburse for railroad flagging and inspection.

~~E~~C. Hold a preconstruction conference at least 15 days before beginning any construction work on railroad right-of-way and give written notice to the Manager of Industry and Public Projects or equivalent position for the railroad company.~~, when railroads are involved, at least 15 days before beginning any construction work on railroad right-of-way~~. Coordinate a work schedule based on the actual date both parties can begin work. Refer to project plans for names of railroad companies.

~~F~~D. Give at least 48 hours verbal notice to the Manager of Track Maintenance or equivalent position for the railroad company having responsibility for the area the project is in before beginning work once the work dates have been established.

~~G. Give written notification to the Superintendent or equivalent position least five days before any cancellation of work, and 15 days before continuing work.~~

~~H~~E. Execute a Contractor's Right~~-~~ of~~-~~ Entry Agreement with the railroad company ~~prior to~~before performing any work within the railroad~~'s~~ right-of-way.

1. Provide all insurance required under the Contractor's Right of Entry Agreement.
2. ~~Send~~ Provide executed copies of this agreement to the Engineer~~ and UDOT's Region Utilities and Railroads Coordinator~~.

~~I. Cleanup the right-of-way to the satisfaction of the railroad company. Contractor pays for any cleanup done by the railroad company to the railroad company's right-of-way that should have been done by the Contractor.~~

~~J. Railroad company personnel do flagging and inspection when work and/or equipment of the Contractor is within 25 ft of any of the railroad company's tracks.~~

~~K~~F. Determine the cost of required railroad flagging, ~~and/or~~ inspection, and cleanup crew. Include these costs in mobilization.

~~L~~G. ~~UDOT~~ The Department deducts payment under a construction accounting item for "Railroad Flagging, Inspection, and Cleanup," and pays the railroad directly for verified billings. No other compensation to the Contractor for this item is allowed.

~~M. Refer to project plans for names of railroad companies.~~

1.13 CONSTRUCTION OVER OR ADJACENT TO NAVIGABLE WATERS

A. Do not interfere with the navigation of waterways when conducting work over, on, or adjacent to navigable waters.

B. Comply with all conditions of ~~the~~ permits from the U.S. Coast Guard or the U.S. Army Corps of Engineers.

1.14 CONTRACTOR'S RESPONSIBILITY FOR WORK

A. Maintain and ~~P~~protect the work included in the contract against injury or damage from all causes whether or not related to performing the work until ~~written acceptance of the project is given~~project final acceptance.

B. Rebuild, repair, restore, and make good all losses, injuries, or damage~~s~~ to any portion of the work~~,~~ under the control of the Contractor at no additional cost to the Department before receiving final acceptance.

C. Rebuild, repair, restore, and make good all losses, injuries, or damage~~s~~ to any portion of the work~~,~~ not under the control of the Contractor, under agreed unit prices or as extra work under Section 01282.

1. Items not under the Contractor's control include, but are not limited to, acts of God ~~or other cataclysmic phenomena of nature~~, acts of ~~the~~ public ~~enemy~~enemies, ~~or~~ acts of governmental authorities, fires, floods, unusually severe weather, damage caused by third party errant vehicles, and vandalism.

D. When work is suspended for any cause:

1. Protect the project from damage.
2. Provide for normal drainage.
3. Erect any necessary temporary structures, signs, or other facilities.
4. Maintain all newly established plantings, seeding, and sodding and protect new tree growth and other designated vegetative growth in an acceptable condition.

1.15 ENVIRONMENTAL PROTECTION

A. Refer to Section 01355.

1.16 ~~VALUE ENGINEERING –~~ CONTRACTOR PROPOSALS FOR VALUE ENGINEERING

A, The Contractor and the Department equally share the savings resulting from a Value Engineering Change Proposal (VECP) offered by the Contractor and approved by the Department.

~~C~~B. The Department considers VECPs that may potentially result in savings and preserve essential functions and characteristics of the facility, including, but not limited to service life, economy of operation, ease of maintenance, desired ~~ability~~capacity, and safety.

C. Base contract bid prices on specified work rather than on VECPs ~~that are~~ subject to Department approval. Complete the contract as bid ~~I~~if a VECP is rejected~~, complete the Contract as bid~~.

~~A. Savings resulting from a Value Engineering Change Proposal (VECP) offered by the Contractor and approved by the Department is shared equally.~~

D. Submitting Proposals:

~~**1.17 VALUE ENGINEERING - SUBMITTING PROPOSALS**~~

~~A~~1. Submit the following materials and information with each proposal:

~~1~~a. A statement that the submission is a VECP.

~~2~~b. A description of the existing work and the proposed changes for performing the work. Discuss the comparative advantages and disadvantages of each.

~~3~~c. A complete set of plans and specifications showing proposed revisions to the original ~~C~~contract.

~~4~~d. A detailed cost estimate for performing the work under the existing ~~C~~contract and under the ~~proposed change~~VECP.

~~5~~e. A time frame within which the Department must make a decision.

~~6~~f. A statement of the probable effect the ~~proposal~~VECP ~~would~~ will have on the contract completion time.

~~7~~g. A description of any previous use or tests of the proposal, ~~the~~ conditions, ~~and the~~ result, ~~and the~~ dates, project numbers, and the Department's action on the ~~proposal~~ VECP if previously submitted.

~~B~~2. The Department determines and notifies the Contractor within five working days ~~that~~ when there is insufficient review time for a response.

~~C~~3. The Department ~~evaluates the need for~~may consider a non-compensable delay adjustment to the ~~C~~contract based on the additional review time necessary and its effect on the Contractor's schedule.

~~D~~4. The Contractor has no claim against the Department for compensable or noncompensable delay if the Department ~~resulting from the failure~~fails to respond within the time indicated in this article when additional information requested from the Contractor is necessary to complete the review.

~~**1.18 VALUE ENGINEERING - CONDITIONS FOR PROPOSALS**~~

E. Requirements:

1. ~~Value Engineering proposals~~VECPs, regardless of their approval by the Department, apply only to the current ~~proposal~~ contract and become property of the Department.

~~A~~2. The Department only considers VECPs that meet the following conditions:

a. ~~Submit proposals without~~Impose no restrictions on use or disclosure.

b. The Department may duplicate or disclose any data necessary to use the ~~proposal~~VECP.

c. The Department ~~can~~ may apply a proposal for general use on other ~~C~~contracts it administers without obligation to the Contractor.

d. ~~The purpose of t~~This provision ~~is to ensure~~does not deny rights provided by law ~~legal right~~ with respect to patented materials or processes.

~~B~~3. Use only proven features that have been employed under similar conditions or projects acceptable to the Department.

~~C~~F. The Department decides whether or not to ~~accept~~ consider a ~~proposal~~VECP. ~~Basis for proposal rejection include requirements for~~ The Department may reject a VECP that requires excessive review, evaluation~~, and/~~or investigation, or that is inconsisten~~tcy~~ with project design policies or criteria. The Department rejects VECPs that:

1. Provide equivalent options to those already in the contract.
2. Contain revisions the Department is already considering or has approved for the contract.
3. Do not generate sufficient savings.
4. Do not provide additional information as requested by the Department, including requests for field investigation results and surveys, design computations, and field change sheet for proposed design changes.
5. Relate to pavement section thickness or type.

~~1.**(M)** The Department does not accept VE proposals related to pavement section structure, strength or performance.~~

D. ~~The Department rejects proposals that provide equivalent options to those already in the contract.~~

~~E. The Department may reject proposals that:~~

~~1. Contain revisions the Department is already considering or has approved for the Contract.~~

~~2. Do not generate sufficient savings.~~

~~3. Do not provide additional information as requested by the Department including requests for field investigation results and surveys, design computations, and field change sheet for proposed design changes.~~

~~F~~G. ~~If the proposal is rejected, t~~The Contractor has no claim to additional costs or delays, including development costs, loss of anticipated profits, or increased material or labor costs if the VECP is rejected.

~~G~~H. The Engineer ~~can~~ rejects ~~all~~ unsatisfactory work resulting from an approved ~~proposal~~VECP.

1. Remove rejected work and reconstruct under the original contract provisions without reimbursement for the work performed under the VECP or for its removal.~~at no additional cost to Department.~~

2. Reimbursement for approved modifications to the ~~proposal~~ VECP to adjust to field or other conditions is limited to the total amount payable for the work ~~of~~ under the contract bid prices.
3. Rejection or limitation of reimbursement is not basis for any claim against the Department.

~~H~~I. The Department does not consider savings generated by contingency items when it is reduced as part of a VECP~~,~~ unless it can be tied to a reduction in contract time.

~~1.19 VALUE ENGINEERING - PAYMENT~~

~~A~~J. The Department pays by change order for ~~Value Engineering proposals~~VECPs ~~accepted~~approved in whole or in part. The Department pays as follows:

1. The ~~C~~contract incorporates changes in quantities of unit bid items~~, and/~~or new agreed price items, as appropriate.
2. The Department pays ~~directly~~ for ~~cost of~~ the revised work directly. The Department also pays the Contractor 50 percent of the savings ~~reflected by the difference~~ between cost of the revised work and the original bid price.
3. The Department does not reimburse costs to develop, design, and implement the ~~proposal~~VECP.
4. Only ~~a~~ the Contractor may submit ~~proposals~~ VECPs and be reimbursed for savings. The Contractor ~~can~~ may submit ~~proposals~~ VECPs for an approved subcontractor.

PART 2 PRODUCTS Not used

PART 3 EXECUTION Not used

END OF SECTION

Supplemental Specification
2005 Standard Specification Book

SECTION 00727

CONTROL OF WORK

Delete Section 00727 in its entirety and replace with the following:

PART 1 GENERAL

1.1 RELATED SECTIONS

A. Section 00555: Prosecution and Progress

B. Section 00725: Scope of Work

C. Section 01282: Payment

D. Section 01721: Survey

1.2 REFERENCES

A. Utah Code Title 63, Chapter 56 – Utah Procurement Code

B. Utah Regulations for Legal & Permitted Vehicles

1.3 AUTHORITY AND DUTIES OF THE ENGINEER

A. The Engineer decides all questions regarding the quantity, quality and acceptability of materials furnished and, work performed, rate of work progress, interpretation of the Ccontract Documents interpretation, project final acceptance, and the acceptable fulfillment of the Ccontract completion.

B. The Engineer has the authority by written order to suspend the work, wholly or in part, by written order without liability to the Department wholly or in part if the Contractor fails todoes not:
   1. Correct conditions unsafe for the project personnel or the public, or
   2. Perform work properly or comply with Complete contract provisions, or
   3. Comply with the Engineer's orders

C. The Engineer can suspend work wholly or partially for:
   1. Periods of unsuitable weather, or
   2. Conditions unsuitable for the prosecution of the work, or
   3. Any other condition or reason determined to be in the Department's interest~~.~~

1.4 PLANS AND WORKING DRAWINGS

A. Keep at least one ~~full~~ complete set of plans~~, and~~ specifications, and standard drawings on the project site at all times.

B. Furnish to the Department structure plans with working drawings that detail required work not included in the ~~C~~contract ~~P~~plans.

C. Include the cost of furnishing all working drawings in the related ~~C~~contract ~~B~~bid ~~I~~items.

1.5 ~~CONFORMITY~~ CONFORMANCE WITH PLANS AND SPECIFICATIONS

A. Perform work and furnish materials to meet ~~C~~contract requirements.

~~C~~B. When a ~~C~~contract item ~~fails to~~does not meet ~~C~~contract requirements but is adequate to serve the design purpose, the Engineer decides the extent to which the work will be accepted and remain in place. The Engineer documents the basis of acceptance ~~by change order~~ and adjusts the ~~C~~contract unit price.

~~B~~C. The Department uses the specified pay adjustment factors for payment ~~If~~ when the ~~C~~contract provides for acceptance of a ~~C~~contract item not complying fully with the minimum requirements~~, the Department uses the specified pay adjustment factors for payment~~.

D. Remove, replace, or correct work at no cost to the Department when a ~~C~~contract item does not meet specified requirements and results in work inadequate to serve the design purpose.

1.6 COORDINATING PLANS, STANDARD SPECIFICATIONS, AND SPECIAL PROVISIONS

A. All supplementary documents are essential parts of the ~~C~~contract and a requirement occurring in one is binding as though occurring in all. Supplementary documents are complementary and provide and describe the complete ~~C~~contract.

B. The governing ranking ~~If there is~~in case of a discrepancy~~, the governing ranking~~ is:

Dimensions	**Information**
1. Plan	1. Special Provisions
2. Calculated	2. Plans
3. Scaled	3. Supplemental Specifications
	4. Measurement and Payment
	5. Standard Specifications
	6. Standard ~~Plans~~Drawings

C. Do not take advantage of any apparent error or omission in the ~~C~~contract.

D. Notify the Engineer promptly of any omissions or errors in the ~~C~~contract so that necessary corrections and interpretations can be made.

1.7 CONTRACTOR COOPERATION

A. Facilitate progress of the work~~,~~ and cooperate with Department inspectors and other contractors.

B. Employ a competent superintendent experienced with the work being performed and capable of reading and understanding the ~~C~~contract ~~D~~documents.
1. The superintendent must have completed the Department's Phase I Partnering Training or be registered for and attend the next available training session.

C. The superintendent must be:
1. Present at the project site at all times.
2. ~~Available~~ Authorized to act as an agent for the Contractor and ~~to~~ execute instructions and directions from the Engineer or authorized representatives.
~~3. Authorized to act as agent for the Contractor on the work.~~

D. Supply all necessary resources to complete the ~~C~~contract regardless of the amount of work sublet.

1.8 COOPERATION WITH UTILITIES

A. Relocate or adjust utilities when specified.
1. Use work procedures that consider the potential of inaccurate or inexact utility locations provided by utility owners, especially for underground installations.

2. Cooperate with the utility owners to remove and rearrange underground or overhead utilities to avoid service interruption or duplicate work by the utility owner.

B. Cooperate with the utility owners to adjust utility fixtures and appurtenances shown in the ~~C~~contract plans.

C. Use work procedures that protect utilities or appurtenances that remain in place during construction.

D. The Department notifies utility companies, pipeline owners, or other utility agencies affected by the work to verify that all utility adjustments, within or adjacent to the construction limits, are made as soon as possible.

E. Notify the appropriate utility authorities of any service interruption resulting from breakage within the construction limits.
1. Cooperate with authorities until service is restored.
2. Work around fire hydrants only after obtaining approval by the local fire authority and then only after making provisions for continued service.

F. Repair damages to utilities that result from carelessness or omission. Restore damaged facilities to the preexisting condition at no additional cost to the Department.

G. When directed by Engineer, adjust or relocate utility facilities or appurtenances found but not noted in ~~C~~contract ~~D~~documents.

1.9 COOPERATION BETWEEN CONTRACTORS

A. The Department reserves the right to contract for and perform other or additional work on or near the work covered by the ~~C~~contract.

B. Cooperate with other contractors working within the project limits. Conduct work without interrupting or inhibiting the progress or completion of work by other contractors.

C. Each ~~c~~Contractor involved accepts all liability, financial or otherwise, in connection with the ~~C~~contract.

D. Each ~~c~~Contractor protects and ~~saves harmless~~holds the Department harmless from any damages or claims caused by inconvenience, delay, or loss from the presence and work of other contractors working within the same project limits.

E. Coordinate and sequence the work with other contractors. Arrange, place, and dispose of materials without interfering with the operations of other contractors on the same project.

1.10 DEPARTMENT-PROVIDED CONTROL POINTS AND ELEVATION BENCH MARKS

A. The Department provides control points and elevation benchmarks.

B. ~~Department deducts the cost of replacing~~ Replace disturbed control points and elevation benchmarks ~~from contract payment~~at no expense to the Department.

1.11 CONSTRUCTION SURVEY

A. Perform the Construction Surveying necessary to properly control the entire work. Refer to Section 01721.

1.12 DUTIES OF INSPECTOR

A. Department ~~I~~inspectors are authorized to inspect all work and materials furnished.
   1. Inspection may extend to the preparation, fabrication, or manufacture of the materials to be used.
   2. ~~Do not~~Inspectors are not authorized to alter or waive the contract provisions, issue instructions contrary to the ~~C~~contract, or act as foreman for the Contractor.
   3. Inspectors may ~~R~~reject work or materials until any issue in question can be referred to and decided by the Engineer.

1.13 INSPECTION OF WORK

A. Provide information, assistance, and safe access to the Engineer for all parts of the work to obtain a complete and detailed inspection.

B. Remove and replace work performed or materials used without inspection by an authorized Department representative at Contractor expense, if ordered by the Engineer. ~~**Exception:** If the Department representative fails to inspect the work after receiving written notice 24 hours in advance of beginning work.~~
   1. Remove and uncover portions of finished work as directed.
   2. Once inspected, restore work to contract requirements.
      a. The Department pays for the additional cost to uncover, remove, and replace or make good the parts removed as extra work, if the uncovered work is found acceptable.

b. The Department does not pay for additional costs to uncover, remove, and replace the covering, or make good the parts removed, if the work is found unacceptable.

C. If the Engineer fails to reject defective work or materials whether from lack of discovery of such defect or for any other reason, such initial failure to reject in no way prevents the later rejection when such defect is discovered, or obligates the Department to final acceptance.

1. The Department is not responsible for losses suffered due to necessary removals or repairs of such defects.

~~C. Remove and uncover portions of finished work, as directed. Once inspected, restore work to Contract requirements.~~

~~1. If the uncovered work is found acceptable, the Department pays for the additional cost to uncover, remove, and replace or make good the parts removed as extra work.~~

~~2. If the work is found unacceptable, the Department does not pay for additional costs to uncover, remove, and replace the covering, or make good the parts removed.~~

~~D~~C. When a government agency, utility, or railroad company ~~is to~~will accept or pay a portion of the ~~C~~contract cost, that organization's representatives may inspect the work. The right to inspect does not make that entity a party to the ~~C~~contract and does not interfere with the rights of parties to the ~~C~~contract.

1.14 REMOVAL OF UNACCEPTABLE AND UNAUTHORIZED WORK

A. Remove and replace any unacceptable work before final acceptance.

1. Work is considered unacceptable if it ~~fails to~~does not meet the ~~C~~contract requirements~~,~~ unless accepted under this Section, article 1.5.

B. Work performed contrary to Engineer's instructions, work beyond plan limits, or extra work performed without the Engineer's permission is excluded from pay consideration and may be ordered removed, restored, or replaced at the Contractor's expense.

1.15 LOAD RESTRICTIONS

A. Observe legal load restrictions when hauling equipment or materials on public roads beyond project limits.

1. A special permit does not ~~decrease~~ relieve the Contractor of liability for damage.
2. Refer to the "Utah Regulations for Legal & Permitted Vehicles."

B. Do not apply weight restrictions to equipment or materials hauled over subgrade.

C. Do not exceed legal gross weight limits on any public roads, structures, or on any component of the pavement structure excluding granular borrow.

D. Suspend construction operations when load restriction violations are observed until the Engineer approves acceptable corrective measures.

E. When public roads are used to haul any type of excavation, borrow, backfill, base, or surfacing material, the Engineer contacts the appropriate law enforcement agency~~,~~ if ~~excess~~ overweight load violations are suspected.

F. For materials imported to the job site ~~(i.e.~~such as ~~A~~asphalt, ~~C~~cement, ~~C~~concrete, ~~S~~steel, etc.~~)~~:

1. Provide the Engineer with invoices showing the gross load weights.
2. The Department withholds payment for material used in the project if invoices are not provided.
3. The Engineer notifies the appropriate enforcement agency if it is suspected that legal gross load limits are exceeded.

1.16 MAINTAINING THE WORK DURING CONSTRUCTION

A. Maintain ~~the~~ all work included in the contract during construction ~~in a satisfactory condition~~ until ~~the project is accepted~~final acceptance.

1. Maintain traffic detour routes and project travel ways in accordance with the Traffic Control Plan.

B. The Engineer immediately notifies the Contractor of failure to meet these provisions.

1. The Engineer maintains the project if unsatisfactory maintenance is not remedied within 24 hours after receiving notice.
2. The Department deducts the entire cost ~~for the Engineer~~ to maintain the work from the ~~monies~~ money due or to become due the Contractor.

C. Include in the bid unit prices the cost of maintaining work during construction until final acceptance.

1.17 OPENING PROJECT SECTIONS ~~OF PROJECT~~ TO TRAFFIC

A. The Engineer may order certain sections of work opened to traffic before completion or acceptance of the work.

B. Opening a section~~s~~ of work does not constitute acceptance of the work or a waiver of any contract provisions.

C. Maintain any section of roadway opened to traffic by order of the Engineer.
   1. When the ordered opening to traffic is not the result of Contractor fault or inactivity, Contractor is paid in accordance with Section 01282.
   2. The Department prepares a change order when the opening is not provided for in the ~~C~~contract. The Department does not compensate the Contractor if the order to open is the result of Contractor fault or inactivity.

D. Engineer gives written notice establishing a time period for completing features of the work for which the Contractor is late.
   1. Engineer may order all or a portion of the project opened to traffic if the Contractor ~~fails to~~does not complete or make a reasonable effort to complete the late work.
   2. Assume liability and responsibility for maintaining the work and conduct the remaining construction operation with minimum interference to traffic without additional compensation.

~~E. Repair damage to the project that is not attributable to traffic (except landslides) at no additional cost to Department.~~

1.18 FURNISHING RIGHT-OF-WAY

A. The Department secures all necessary right~~s~~-of-way ~~in advance of~~before construction, except as provided in the ~~C~~contract.

1.19 PROJECT ACCEPTANCE

A. Partial Acceptance
   1. The Contractor ~~M~~may request ~~final inspection~~acceptance of a unit when:
      a. A unit or portion of the project is substantially complete.
      b. The unit or portion is considered or determined necessary for the convenience of traffic such as a structure, ~~an~~ interchange, roadway section ~~of road~~, intersection, substation, or portion of highway lighting or traffic signal systems.
   2. The Engineer may make written acceptance of a unit as complete ~~I~~if the unit has been completed according to the ~~C~~contract~~, the Engineer may make written acceptance of that unit as complete~~ and relieve the Contractor of further responsibility for that unit.
   3. Partial acceptance neither voids nor alters any contract terms.

B. ~~Final Acceptance~~Substantial Completion
~~The Engineer conducts an inspection upon receiving notice from the Contractor of project Substantial Completion. The Engineer identifies any necessary corrective work and work necessary to achieve physical completion of the project. If the~~

~~Contract is found to be substantially complete, the Engineer notifies the Contractor in writing~~.

1. Request inspection and verification by the Engineer when the project is substantially complete.
   a. The Engineer performs an inspection and identifies any necessary corrective work and work necessary for physical completion.
   b. The Engineer notifies the Contractor in writing and stops contract time when the project is found to be substantially complete.
   ~~1~~c. Immediately comply with and execute instructions given by the Engineer if the inspection discloses any unsatisfactory work.
   ~~2~~d. Execute all work necessary ~~to achieve Physical Completion~~for physical completion within 30 calendar days of the substantial completion date in accordance with Section 00555.

C. Final Acceptance

~~3~~1. ~~Upon correction of work and upon receipt of notification from the Contractor the project is Physically Complete, the Engineer conducts another inspection that constitutes the final inspection.~~Request inspection and verification by the Engineer when the project is physically complete.
   a. The Engineer performs the final inspection and identifies any necessary corrective work.
   b. Immediately comply with and execute instructions given by the Engineer if the inspection discloses any unsatisfactory work.
   c. The Engineer notifies the Contractor in writing of the date of final acceptance when the project is determined to be physically complete and identifies any documents required to complete the contract.
   d. Furnish all documentation identified by the Engineer to complete the contract within 30 days of notification of final acceptance in accordance with Section 00555.

~~4.~~ ~~If the project has been satisfactorily completed and determined to be Physically Complete, the Engineer notifies the Contractor in writing of the date of final inspection and acceptance~~.

1.20 ~~PROCEDURES FOR DISPUTE RESOLUTION~~CLAIMS FOR ADDITIONAL COMPENSATION OR CONTRACT ADJUSTMENT

A. Notify ~~Department verbally and~~the Engineer in writing of ~~the~~ any intent to file a claim ~~dispute in accordance with Section 00725~~for additional compensation for work or material before beginning or continuing the affected work~~, if additional compensation is considered due for work or material not covered in the Contract~~.

1. Follow the notification requirements for differing site conditions, changes, and requests or claims for additional compensation under Section 00725.
2. The Engineer responds as described for differing site conditions changes, and requests or claims for additional compensation under Section 00725.

~~B. The Engineer responds as described under Section 00725 following notification, indicates whether or not a change has occurred, and provides further information concerning the method and manner of further performance of the work~~.

~~C~~B. ~~Provide cooperation and information to~~Work closely with the Engineer during ~~the period of~~ notification, review, and evaluation to resolve the contract question and avoid further claims.

~~D~~C. ~~Department does not grant additional compensation if verbal and or written notification is not given, or if the Engineer is not given proper facilities for keeping strict account of actual costs.~~The Contractor waives any claim for additional compensation if the Engineer is not notified or is not afforded proper facilities for strict accounting of actual costs.

1. ~~Department does not construe notice by the Contractor, and the Engineer's accounting of costs as substantiating the validity of the claim.~~Notifying the Engineer and accounting of costs does not substantiate the claim's validity
2. ~~Department equitably adjusts the Contract if the dispute is found to have merit.~~The contract will be adjusted only if the claim is found to have merit.

~~1.21 PROCEDURES FOR RESOLUTION OF CLAIMS~~

D. Submit claim with enough detail to enable the Engineer to understand the basis for entitlement and the resulting costs. Include the following information with each claim submitted:

~~A. Disputes that are not resolved are escalated to the claims procedure.~~

~~1. Provide written notification of the intent to make a claim.~~

~~2. Submit the formal claim in writing and with sufficient detail to enable the Engineer to ascertain the basis and amount of the claim.~~

~~B. As a minimum, include the following information with each claim submitted:~~

1. A detailed ~~factual~~ statement ~~of the claim for additional compensation and time,~~ providing all necessary dates, locations, and items of work affected by the claim.
2. The date on which actions or conditions resulting in the claim occurred or ~~conditions resulting in the claim~~ became evident.
3. ~~The n~~Name, title, and activity of each Department employee knowledgeable about facts that ~~gave rise to~~are the basis of the claim.
4. ~~The n~~Name, title, and activity of each Contractor employee knowledgeable about facts that ~~gave rise to~~are the basis of the claim.
5. The specific contract provisions ~~of the Contract~~ that support the claim and a statement of ~~the reasons~~ why ~~such provisions~~they support ~~the claim~~it.

~~6. All detailed facts that support positions related to a decision that the Contract leaves to the Engineer's discretion or provides that the Engineer's decision is final~~.

~~7~~6. ~~Identity of~~ Identification of pertinent documents, and the substance of any ~~material~~relevant verbal communications relating to the claim.

~~8~~7. A statement whether the additional compensation or extension of time is based on contract provisions or an ~~alleged~~ asserted breach of ~~C~~contract.

~~9. Copies of any identified documents, other than Department documents and documents previously furnished to the Department that support the claim (manuals that are standard to the industry may be included by reference).~~

~~10~~8. For ~~an extension of~~ time extension or compensation for delay requests, include:

a. The specific days for which a time extension is requested.

b. The specific reasons a time extension should be granted.

~~c. The specific provisions under which a time extension is requested.~~

c. Documents and reports specified for determining compensation and contract time extension for excusable delays under Section 00555.

~~11~~9. ~~The e~~Exact amount and specifics of additional compensation ~~requested~~ sought and a breakdown of the cost into the following categories:

a. Direct labor~~.~~

b. Direct materials~~.~~

c. Direct equipment~~.~~

1) Do not exceed actual cost on rates claimed for each piece of equipment.

2) In the absence of actual equipment cost, the rates for the equipment, when in use, cannot exceed the force account rates established by Section 01282.

d. ~~Job overhead.~~Field indirect costs

e. ~~Overhead (general and administrative).~~Home office overhead

f. Subcontractor's claims

1) ~~(in~~Provide the same level of detail as specified in ~~C~~contract documents ~~is required~~ for any subcontractor's claims~~)~~.

~~12~~10. Certification: Submit a statement to the Engineer containing the following language:

Under the penalty of law for perjury or falsification, the undersigned,

_____	_____	_____
Name	Title	Company

hereby certifies that the claim for extra compensation and time, if any, made herein for work on this ~~C~~contract is a true statement of the actual costs incurred and time sought, and is fully documented and supported under the ~~C~~contract between the parties.

Dated _____/s/_____
Subscribed and sworn before me this _____day of _____
Notary Public _____
My Commission Expires _____

~~C~~E. Failure to either submit information and details as described in this ~~S~~section for any claim, or failure to submit any claim before the date of final acceptance, constitutes a waiver of the claim~~s~~.

~~1.22~~1.21 RECORD KEEPING FOR ~~RESOLUTION OF~~ CLAIMS

A. Maintain ~~full and~~ complete records of all costs and additional time incurred for any alleged claim.

B. Permit the Engineer access to those records and any other records as required to determine the facts or contentions involved in the claim.

C. Retain all records for a period of not less than three years after final acceptance.

~~1.23~~1.22 AUDITING OF CLAIMS

A. All claims filed against the Department are subject to audit at any time following ~~the~~ filing ~~of~~ the claim.

B. ~~Employees of t~~The Department or an auditor under contract with the Department may conduct the audit. The audit may begin at any time during the life of the ~~C~~contract, or 20 calendar days after notice is provided to the Contractor, the subcontractors, or the Contractor's agents if more than 60 calendar days after the final acceptance date of the ~~C~~contract have elapsed.

C. Provide adequate facilities acceptable to the Engineer for the audit during normal business hours. Cooperate with the auditors.

D. Failure of the Contractor, subcontractors, or agents to maintain and retain sufficient records to allow the auditors to verify all or a portion of the claim or to permit the auditor access to the books and records of the Contractor, subcontractors, or agents constitutes a waiver of the claim and bars any recovery.

E. As a minimum, make the following documents available to auditors:
1. Daily time sheets and supervisor's daily reports
2. Union agreements, if any
3. Insurance, welfare, and benefits records
4. Payroll registers

5. Earnings records
6 Payroll tax forms
7. Material invoices, purchase orders, requisitions, and all material and supply acquisition contracts ~~and requisitions~~
8. Material cost distribution work sheet
9. Equipment records ~~(~~including list of company equipment, rates, etc.~~)~~
10. ~~Vendors', rental agencies', subcontractors', and agents'~~Vendor rental agreements and subcontractor invoices
11. Subcontractor~~s' and agents'~~ payment certificates
12. Canceled checks (payroll and vendors)
13. Job cost report
14. Job payroll ledger
15. General ledger, general journal (if used), and all subsidiary ledgers and journals together with all supporting documentation pertaining to entries made in these ledgers and journals
16. Cash disbursements journal
17. Financial statements for all years reflecting the operations on this project
18. Income tax returns, whether such records are maintained by the company involved, its accountant, or others
19. Depreciation records on all company equipment
20. All other documents used to develop costs for the Contractor's internal purposes to establish the actual cost of owning and operating equipment
21. All documents that reflect the actual Contractor profit and overhead during the contract performance and each of the five years before starting this project
22. All documents related to preparing the Contractor's bid, including final documents on which the bid was based. Exclude documents placed in escrow
~~17~~23. All documents that relate to each and every claim together with all documents that support the amount of damages as to each claim
~~18~~24. Work-sheets used to prepare the claim establishing the cost components for items of the claim including, but not limited to, labor, benefits and insurance, materials, equipment, subcontractors, all documents that establish the time periods, individuals involved, and the hours and rates for the individuals~~, and the rates for the individuals.~~

F. Full compliance with the provisions of this article is a contractual condition precedent to the right to seek judicial relief.

~~1.24~~1.23 HIGHER LEVEL REVIEW ~~FOR RESOLUTION~~ OF CLAIMS

A. ~~Submit all claims for higher-level review~~Provide written notification to the Engineer ~~in writing~~ within 10 calendar days of the Engineer's denial of a claim requesting a higher-level review, when not accepting the Engineer's denial action.

B. Failure to submit a request within this 10-day time frame is considered acceptance of the Engineer's denial action.

~~1.25~~1.24 CLAIMS ~~BOARD OF~~ REVIEW BOARD

A. Pursue administrative resolution of any claim with the Engineer or the designee of the Engineer.

B. If no agreement is reached, at the Contractor's written request to the Engineer, the ~~Engineer~~ Director for Construction and Materials schedules a hearing before ~~a~~ the Department ~~"Claims Board of Review"~~Claims Review Board when deemed to be in the best interest of both the Contractor and the Department.

2. The claim may be presented informally, with or without legal counsel.

a. Notify the Department at least 10 calendar days before the hearing when using legal counsel.

C. The Board makes recommendations and outlines their reasoning to the UDOT Deputy Director within 30 calendar days after the claim hearing.

D. The UDOT Deputy Director makes an offer of settlement within 45 calendar days after the claim hearing.

E. The decision of the UDOT Deputy Director is administratively final.

F. The Contractor has the option of rejecting and appealing the Department's decision to the State Procurement Appeals Board in accordance with Utah Code Title 63, Chapter 56 – Utah Procurement Code.

PART 2 PRODUCTS Not used

PART 3 EXECUTION Not used

END OF SECTION

Supplemental Specification
2005 Standard Specification Book

SECTION 01282

PAYMENT

Delete Section 01282 in its entirety and replace with the following:

PART 1 GENERAL

1.1 RELATED SECTIONS

A. Section 00555: Prosecution and Progress

B. Section 00570: Definitions

B. Section 00725: Scope of Work

C. Section 00727: Control of Work

D. Section 01284: Prompt Payment

1.2 REFERENCES

A. *Rental Rate Blue Book for Construction Equipment* ~~Rental Rate Blue Book for Construction Equipment (Blue Book)~~

B. Wall Street Journal

1.3 SCOPE OF PAYMENT

A. The Department fully compensates the Contractor as provided in the ~~C~~contract for:
   1. Furnishing all materials, labor, equipment, tools, transportation, and incidentals required for acceptable completion of the work.

B. Lump sum or each:
   1. Consider ~~Complete~~ payment as full compensation for all resources and incidentals necessary to complete ~~for~~ the work. ~~described in the Contract when used as an item of payment.~~

C. The Department will not pay the Contractor for:
1. Work that is in excess of that contained in the ~~C~~contract.
2. Removal and replacement of defective work.
3. Loss of anticipated profits.

D. ~~Neither p~~Partial payment ~~n~~or releas~~e~~ing of retainage does not relieve~~s~~ the Contractor of the obligation to correct all defective work or materials.

1.4 ELIMINATED ITEMS

A. Accept the Engineer's authority to eliminate contract items found to be unnecessary to complete the work.

B. Request reimbursement for all costs incurred before notification of elimination.

~~1.4~~1.5 ~~ALTERED~~ VARIATION IN QUANTITIES AND SIGNIFICANT CHANGES IN CHARACTER OF WORK

A. When the accepted quantities of work vary from the estimated quantities in the ~~C~~contract, the Department either pays the original contract unit prices for the accepted quantities of work ~~done~~or provides adjustment in accordance with Section 00725.
1. The Department does not allow compensation for any increased expenses, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly from such alterations or indirectly from unbalanced allocation among the contract items of overhead expense and subsequent loss of expected reimbursement or from any other cause.
~~2. Request any cost adjustments in accordance with Section 00725.~~

~~1.5~~1.6 DIFFERING SITE CONDITIONS, CHANGES, AND EXTRA WORK

A. The Department pays for differing site conditions, changes, and extra work ~~performed under Section 00725~~ at either unit price or lump sum as stipulated in the order authorizing the work.

B. ~~The Contractor's representative and the Engineer compare independent cost estimates to determine the cost of extra work.~~The Engineer uses contract unit prices if they are representative of the work to be performed.
1. Unit price work will be reimbursed at the rates established in the contract.
a. These rates include compensation for the actual work and associated field indirect costs, home office overheads, profit, and

all other costs incidental to the work unless otherwise defined in the contract.

C. ~~At the Engineer's request, provide a cost analysis for the extra work detailed as follows:~~

~~1. Labor classifications, total hours for each classification, wage rate, and extension for each classification.~~

~~2. Cost of fringe benefits and subsistence.~~

~~3. Quantities of materials, prices, and extensions.~~

~~4. Equipment classifications, total hours, rental rate, and extension for each unit of machinery and equipment.~~

~~5. Transportation of materials and equipment.~~

~~6. If applicable, subcontractors' cost analysis.~~

Negotiated lump sum or unit pricing for changes to the contract work will be based on the Contractor's estimate to do the work as validated by the Engineer's review or independent cost estimate.

1. Support the price with a detailed cost estimate. Include the following in the estimate:
   a. Labor and equipment hours based on agreed upon productivity rates.
   b. Use the actual cost of wages, benefits, burdens, and other labor related expenses for the labor rates applied to the estimated man-hours.
      1) Include certified accounting records verifying these costs or make them available upon request of the Engineer.
   c. Materials will be reimbursed at actual cost as determined by supplier invoices or estimates.
      1) Materials produced on site, such as granular borrow or UTBC will be reimbursed according to the labor and equipment rates used to produce such materials.
   d. Use the actual cost of the equipment to the Contractor for equipment rates applied to the estimated equipment hours.
      1) Include certified accounting records verifying these costs or make them available upon request of the Engineer.
2. A markup of 15 percent will be paid on all expenses identified above. This markup compensates the Contractor for home office overheads, profit, and incidental costs.
3. No other expenses will be compensated unless approved by the Engineer.

1.7 COMPENSATION FOR EXCUSABLE DELAYS

A. Document all costs claimed that result directly from a delay caused by the Department. Refer to Section 00555.

1. Use actual records kept in the usual course of business and measure increased ownership expenses according to generally accepted accounting principles.
   a. Do not use equipment rental rate guides.
2. The Department does not compensate for the following:
   a. Profit more than provided in accordance with this section
   b. Loss of profit
   c. Labor inefficiencies
   d. Home office overhead exceeding that provided
   e. Consequential damages, including, but not limited to, loss of bonding capacity, loss of bidding opportunities, and insolvency
   f. Any indirect costs or expenses
   g. Attorney's fees, claims preparation expenses, or litigation costs

B. Compensable costs will be determined as follows:
1. **Direct Costs:** Actual costs of the Contractor's workforce and equipment idled by the delayed activity.
   a. Provide an accountant's certification of all costs.
2. **Field Indirect Costs:** Actual costs for job-site supervision and field office operating costs, or other costs not directly associated with a particular work activity, for the period of delay.
   a. Provide an accountant's certification of all costs.
3. **Home Office Overhead:** Unabsorbed home office costs that would have been paid for by the project billings if the work had not been delayed. To be entitled to home office overhead costs, demonstrate the delay-causing event resulted in financial harm.
   a. No unabsorbed home office overheads will be reimbursed for the first five calendar days of the delay-causing event.
   b. Calculate home office overhead cost from the sixth calendar day of the delay-causing event through its end if the project is between 0 and 95 percent complete.
   c. Use the following formula to calculate home office overhead costs:

$$D = E\,[0.05(A-B)/C]$$

Where:

0.05 = Allowed markup for home office overhead
A = Current contract value
B = Total value of work completed to date based on the most recent partial estimate processed before the submittal of the delay claim
C = Total contract duration in calendar days - with time added for changes, but excluding time added for delay

D = Total reimbursable amount for unabsorbed home office overhead

E = Number of calendar days the critical path of the schedule is delayed due to the delay-causing event minus five.

d. No home office overheads will be reimbursed if the delay occurs after the project is 95 percent complete.

C. The total reimbursable cost for a compensable delay is the sum of the daily agreed to costs for direct costs, field indirect costs, and unabsorbed home office overhead costs as computed in accordance with this article for the duration of the delay. No other costs, including profit, will be reimbursed.

~~1.6~~1.8 FORCE ACCOUNT ~~WORK - GENERAL~~

A. When the Contractor and Engineer are unable to negotiate an agreed upon price for changed or added work, ~~Instead of a unit price or lump sum basis specified above,~~ the ~~Department~~ Engineer may require the Contractor to do such work on a force account basis.

1. Costs reimbursed in accordance with this section are considered full and complete compensation for:
   a. All field indirect costs, including project management and supervision, field office operating costs, and all field office staff, except for time spent in immediate and direct supervision of the force account work.
   b. All home office overhead costs and other indirect costs incurred as a result of the force account work.
2. The Department does not compensate for small tools (costing $500 or less) or any other costs for which no specific allowance is provided in this section.

~~B. Department does not make additional allowance for:~~

~~1. Timekeepers, bookkeepers, or other general office help.~~

~~2. General superintendent except for the time spent in direct supervision of the force account work.~~

~~3. The use of small tools (tools costing $400 or less) or other costs for which no specific allowance is herein provided.~~

~~C. Department does not pay for pickup trucks used solely for transportation.~~

~~D. Department pays straight time for all hours worked. Overtime must have the prior written approval of the Engineer.~~

~~1.7 FORCE ACCOUNT WORK - LABOR~~

~~A~~B. Compensation for labor:

1. The Department pays straight time for all hours worked. Overtime must have the prior written approval of the Engineer.
2. The Department pays for all labor, including direct supervision~~,~~ used in the actual and direct performance of the work~~,~~ at the ~~rate of~~ wage ~~(~~or scale~~)~~ agreed upon in writing before beginning work.
3. The Department reimburses for actual costs paid to or in behalf of ~~workmen~~ workers, including subsistence~~, and~~ travel allowances, and health and welfare required by collective bargaining agreements or other employment contract generally applicable to the classes of labor employed on the work.
   a. The Department pays to Contractor an amount equal to 60 percent of the sum of the above items to cover the costs of bonds, insurance, taxes, and all other indirect costs, etc.
   b. Submit wage, payroll, and cost records pertaining to work paid for on a force account basis to the Engineer. This information is open to inspection or audit.

~~B. Department reimburses for actual costs paid to or in behalf of workmen including subsistence and travel allowances and health and welfare required by collective bargaining agreements or other employment contract generally applicable to the classes of labor employed on the work.~~

~~1. Department pays to Contractor an amount equal to 60 percent of the sum of the above items to cover the costs of bonds, insurance, taxes, etc.~~

~~2. Submit wage, payroll, and cost records pertaining to work paid for on a force account basis to the Engineer. This information is open to inspection or audit.~~

~~1.8~~FORCE ACCOUNT WORK - MATERIALS

~~A~~C. Compensation for materials:

1. The Department pays for all materials accepted by the Engineer and incorporated in the project at actual cost~~:~~, including sales taxes and transportation charges plus 15 percent.
   a. Materials such as saw blades, drill bits, etc., expended in the course of performing the work, excluding equipment, are considered incorporated in the project. ~~Including sales taxes and transportation charges plus 15 percent.~~

   ~~Excluding machinery rentals as hereinafter set forth.~~

   b. Include invoices with statements for all materials used. Certify by affidavit the cost of material furnished from Contractor's stocks when no invoice is available.

   ~~Include invoices with statements for all materials used. Certify by affidavit the cost of material furnished from Contractor's stocks when no invoice is available.~~

~~1. Including sales taxes and transportation charges plus 15 percent.~~

~~2. Excluding machinery rentals as hereinafter set forth.~~

~~B. Include invoices with statements for all materials used. Certify by affidavit the cost of material furnished from Contractor's stocks when no invoice is available.~~

~~1.9FORCE ACCOUNT WORK - CONTRACTOR OWNED EQUIPMENT~~

~~A~~D. Compensation for equipment:

1. The Department does not pay for pickup trucks used solely for transportation.
2. The Department pays for machinery or special equipment, excluding small tools, authorized by the Engineer at an hourly rate obtained from the ~~"~~*Rental Rate Blue Book for Construction Equipment*~~," (Blue Book)~~. These hourly rental rates are determined by the monthly rental rate taken from the above-mentioned publication divided by 176. The total hourly rates have been computed from equipment costs currently in effect and do not include costs for operating personnel. ~~Updated supplements are authorized for use Statewide on specified dates.~~Obtain this publication through:

   Equipment Watch
   1735 Technology Drive, Suite 410
   San Jose, CA 95110-1313
   Phone: (800) 669-3282
   Fax: ~~(408) 467-6795~~(800) 224-3527
   Refer to http://www.udot.utah.gov/index.php/m=c/tid=719.

   The rates require adjustment by a Regional Factor and a Depreciation Factor with operating and standby rates established as follows:

   a. Operating Rate - For those hours the equipment is actually in use.
      1) Includes ownership and operating costs adjusted for Depreciation and Region factors.~~Adjust for depreciation and region factors.~~
   b. Standby Rate - Compensation for equipment required to be at the work site but not operating. This rate is 50 percent of the adjusted ownership and operating costs computed above.
      1) The duration of allowable standby time is to be approved in writing by the Engineer with a maximum of eight hours per day or 40 hours in a ~~normal~~ week.

~~B. The total hourly rates derived from the above have been computed from equipment costs currently in effect. The rates derived do not include costs for operating personnel.~~

~~C. The rates require adjustment by a Regional Factor and a Depreciation Factor.~~

~~D. Equipment Rental rates can fall in the following two categories:~~

~~1. Operating Rate - For those hours the equipment is actually in use. Includes ownership and operating costs.Adjust for depreciation and region factors.~~

2. Standby Rate - Compensation for equipment required to be at the work site but not operating. This rate is 50 percent of the adjusted ownership costs computed above.

The duration of allowable standby time is to be approved in writing by the Engineer with a maximum of eight hours per day or 40 hours in a normal week.

3. When the "Manufacturer's Rated Capacity" falls between those shown in the "*Rental Rate Blue Book for Construction Equipment*" this manual, the Department uses the shown capacity that is closest to the manufacturer's.

4. Agree upon all rates in writing before beginning work.

5. Obtain approval from the Office of Construction and MaterialsEngineer for any equipment rental rates not provided before the start of any "force account work."

6. The Department allows "move-in" and "move-out" transportation cost for a piece of equipment not available on the job, if the particular piece of equipment is not moved onto the job under its own power.

   a. The Department allows hourly operating rate for equipment moved to the site under its own power.

   b. The Department pays these charges only once for any particular piece of equipment except in unusual circumstances that must be justified in writing and agreed to by the Engineer.

E. When the "Manufacturer's Rated Capacity" falls between those shown in the *"Rental Rate Blue Book for Construction Equipment"* this manual, the Department uses the shown capacity that is closest to the manufacturer's. Do not interpolate for rates in between.

F. Agree upon all rates in writing before beginning work.

G. Obtain approval from the Office of Construction and Materials for any equipment rental rates not provided before the start of any "force account work."

H. Department allows "move-in" and "move-out" transportation cost for a piece of equipment not available on the job, if the particular piece of equipment is not moved onto the job under its own power.

1. Department allows hourly operating rate for equipment moved to the site under its own power.

2. Department pays these charges only once for any particular piece of equipment except in unusual circumstances that must be justified in writing and agreed to by the Engineer.

1.10FORCE ACCOUNT WORK - RENTED OR LEASED EQUIPMENT

A. 7. When the equipment to be used is specialized in nature and is not available in the Contractor's inventory and is rented or leased from an outside source, the Department adds a 10 percent allowance on the first $5,000 plus five percent of the balance in excess of $5,000 for overhead for all rented or leased equipment paid for by invoices.

1. a. Where the rental rate charged exceeds the rate determined by the *"Rental Rate Blue Book for Construction Equipment"*Blue Book, submit the rental or lease agreement to the Engineer for approval.

2. b. The Department pays equipment-operating costs at the rate from the *"Rental Rate Blue Book for Construction Equipment"* Blue Book for rented or leased equipment for each hour the equipment was actually used.

B. 8. When the required equipment is in the Contractor's available inventory but not on the project site, the equipment may be rented from a local source. The Engineer may approve rental rates for equipment obtained from local sources when such rates are within 10 percent of the *"Rental Rate Blue Book for Construction Equipment"* Blue Book. When the equipment is to be used less than a week, "move-in" and "move-out" costs for Contractor owned equipment may be considered when comparing rental costs of equipment obtained from local sources.

1. a. This option is only allowed when the cost of locally rented equipment would be is less than using Contractor owned equipment including "move-in" and "move-out" charges.

2. b. Such rentals must be supported by a cost analysis indicating the method used was the least expensive.

3. c. The Department reimburses for such equipment based on the *"Rental Rate Blue Book for Construction Equipment"* If the Contractor elects to rent equipment of a type that is in the Contractor's inventory and the rental costs exceed that allowed by this article, the Department reimburses for such equipment based on the Blue Book.

1.11FORCE ACCOUNT WORK - SUBCONTRACTS

A E. Subcontracts:

1. For all force account work performed under an approved subcontract, the Department pays an additional allowance equal to ten six percent of the first $5,000 plus five percent of the balance in excess of $5,000 for overhead for the subcontract.

2. The Engineer reviews each situation to determine that performing the work by subcontract is justified.

B. The Engineer reviews each situation to determine that performing the work by subcontract is justified.

1.12FORCE ACCOUNT WORK - STATEMENTS

A F. The Contractor's representative and the Engineer cCompare cost records of the cost of work done daily with the Engineeras ordered on a force account basis.

B G. At the Engineer's request, provide an itemized statement of the cost of the force account work detailed as follows:

1. Name, classification, date, daily hours designating straight time and overtime, total hours, rate, and extension for each laborer and supervisor. (Payrolls may be used for part some of this information.)
2. Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment.

3. Quantities of materials, prices, and extensions.
4. Transportation of materials and equipment.
5. Cost of fringe benefits and subsistence.
6. Subcontractors.

~~**1.13 ELIMINATED ITEMS**~~

~~A. If the Department determines items contained in the Contract are unnecessary, the Engineer eliminates the items from the Contract with a Change Order to the Contractor. This action does not invalidate the Contract.~~

~~B. Request reimbursement for all costs incurred before notification of elimination. Refer to Section 00725.~~

~~1.14~~1.9 PROGRESS PAYMENTS

A. The Department makes progress payments at least once each month as the work is progressing.

B. More frequent payments may be made during any period when the Department determines that the value of work performed during the period is ~~of~~ sufficient ~~amount~~ to warrant a payment.

C. Payments are based on estimates prepared by the Engineer of the value of the work performed and materials in place under the ~~C~~contract and for payment for material on hand in accordance with ~~materials delivered under~~ this ~~S~~section~~, article, Payment for Material on Hand~~.

D. The Department ~~makes no~~does not make any progress payment when the total value of the work done since the last estimate is less than $1,000.

E. From the total value of work, the Department deducts and retains five percent until after the entire ~~C~~contract has been completed in an acceptable manner, with the following exceptions:
   a. Retention for subcontracted work paid upon satisfactory completion and acceptance by the Department. Refer to Section 01284.
   b. When no less than 95 percent of the work has been completed, ~~and with the consent of the Surety,~~ the Engineer may prepare a semi-final estimate with the consent of the Surety from which the Department retains ~~1½~~1.5 percent of the original contract amount. The Department certifies the remainder for payment, less all previous payments.

F. The Contractor may enter into an addendum agreement providing for ~~the~~ payment of retained ~~monies~~ money into an escrow account, or the Department does so automatically.

1. ~~These monies are to be~~This money is applied to~~ward~~ the purchase of approved securities that are to be held by an escrow agent until satisfactory completion of the construction ~~C~~contract.
2. The value of the securities placed in escrow has a minimum value equal to or greater than the amount that would otherwise be retained.
3. The addendum agreement must be executed concurrently with the execution of the construction ~~C~~contract. Agreement forms are available in the office of the Department's ~~Engineer~~ Director for Construction and Materials.

G. The Department pays the Contractor within 14 calendar days after certification and approval of billings and estimates.

1. Contractor and Engineer agree to a Saturday partial estimate closing date. Succeeding partial estimates close on the same Saturday for each succeeding month.
2. Contractor approves partial estimate ~~prior to~~before submission.

~~1.15~~1.10PAYMENT FOR MATERIAL ON HAND

A. When the Contractor presents delivery copies of invoices, the Department may include in the partial payment invoice, advance payments for acceptable nonperishable materials purchased expressly for incorporation in the work when delivered in the vicinity of the project~~,~~ or stored in approved storage place.

1. The Engineer determines the amount to be included in the estimate, but in no case will the amount exceed the value of the materials as shown on the delivery invoice~~,~~ or 75 percent of the in-place price, whichever is less.
2. When the approved storage location is other than the project site, furnish evidence that the stockpiled materials are irrevocably obligated to the project.
3. The Department does not pay when the invoice value of such materials, as determined by the Engineer, amounts to less than $2,000 or if materials are to be stored less than 30 calendar days.
4. Within 60 calendar days following the date of the estimate invoice on which the stockpile material is to be paid by the Department, furnish to the Engineer certified paid invoices or a certified statement with a copy of the check showing payment.
5. Material will be removed from the next partial estimate as stockpiled materials if proper invoices showing payment to the supplier is not received.

B. The Department ~~makes no~~does not make any partial payment on living or perishable materials until incorporated as specified in the ~~C~~contract.

C. The Department does not pay for materials brought onto the site at the Contractor's election that may be incorporated into the project such as fuels, supplies, metal decking forms, ties, or supplies used to improve efficiency of operations.

D. Approval of partial payment for stockpiled materials does not constitute final acceptance of such materials for use in completing items of work.

E. The Department purchases at actual cost and without any percentage allowance for profit, materials delivered to the project in compliance with the ~~C~~contract or left unused due to changes in plans or variation in quantities, if the materials are not practicably returnable for credit.
   1. Purchased materials become the property of the Department.
   2. Actual costs are based on invoice price plus transportation costs ~~to the work~~.

F. Payment is limited to contract quantities unless ordered by the Engineer. Assume responsibility for excess materials delivered to the project~~,~~ or aggregate produced beyond the contract amount without authority from the Engineer.

G. At the option of the Department, surplus aggregates up to the contract quantities may be purchased provided:
   1. The material is stockpiled where directed.
   2. The material meets specification requirements when stockpiled.

H. The Department pays for material accepted on an agreed price basis, which price is normally the Contractor's production cost. ~~In addition, t~~The Department pays the cost to haul the materials to the stockpile site and place in pile at the rate of ~~9~~ 18 cents per ton mile or ~~20~~ 33 cents per cubic yard mile.

~~1.16~~1.11 FINAL PAYMENT

A. When the project has been accepted in accordance with Section 00727, the Engineer prepares the final estimate of work performed.
   1. The Department processes the estimate for final payment ~~I~~if the Contractor approves the final estimate ~~or~~ and does not object to the quantities within 30 calendar days of receiving the final estimate~~, the Department processes the estimate for final payment~~.
   2. ~~After approval of the final estimate by the Contractor,~~ The Department pays ~~for~~ the entire sum due after deducting all previous payments and all amounts to be retained or deducted under the provisions of the ~~C~~contract after approval of the final estimate by the Contractor.

B. File with the Department a full, complete, and itemized written statement justifying the adjustment within 30 calendar days after the final estimate is submitted for approval ~~I~~if additional payment is due from the Department~~, file with the Department a full, complete, and itemized written statement justifying the adjustment within 30 calendar days after the final estimate is submitted for approval~~.

1. ~~All disputes not itemized in said statement are waived by the~~ Contractor waives all disputes not itemized.
2. Submission of disputes by the Contractor will not be reason for withholding full payment of the total value of work shown on the Engineer's final estimate.
3. The Department evaluates the dispute.
   a. The final estimate is revised accordingly, under the terms of the contract ~~I~~if it is determined that additional payment is due~~,. the final estimate is revised accordingly, under the terms of the Contract.~~
   b. ~~If not, t~~The estimate as submitted is final if it is determined that no additional payment is due.

C. All prior partial estimates and payments are subject to correction in the final estimate and payment.

D. The Department ~~has~~ completes and delivers the final estimate ~~complete and~~ to the Contractor within 90 days of ~~when the Contractor reaches C~~contract ~~C~~completion.

~~1.17~~1.12FUEL COST ADJUSTMENT~~S FOR FUEL COST~~

A. ~~This price~~Fuel cost adjustment ~~provision~~ is intended to ~~minimize~~ limit the risk to the Contractor ~~due to~~from potentially unstable ~~volatile~~ fuel prices ~~fluctuations for fuel~~ that might occur ~~throughout the duration of~~during the ~~C~~contract.

1. This provision is not ~~designed~~ intended to estimate actual quantities of fuel used in construction operations or compensate for actual price variations experienced by the Contractor.
2. The Department determines adjustments under the provisions of this section and presumes the Contractor has relied on these provisions when determining unit bid prices.

~~1. The Contractor may invoke this provision at any time during the Contract by written notification to the Engineer.~~

~~2. Adjustments are then made on all prior and future partial estimates. When this provision becomes effective, it remains in effect for the duration of the Contract.~~

~~B. This provision is not designed to estimate actual quantities of fuel used in construction operations, but to provide a reasonable basis for calculating a fuel price adjustment based on average conditions.~~

~~C. Department determines compensation adjustments under the provisions of this Section, and presumes that the Contractor has relied on these provisions for compensation adjustments when determining unit bid prices.~~

~~D~~B. Abbreviations and Terms ~~for calculating adjustments for fuel costs~~:

1. ~~Fuel Partial~~ Estimate Price for fuel ~~Base Price~~ (EPf): ~~–~~The ~~average of all base~~ fuel price~~s determined during~~established for the partial estimate period.

   a. On the first Monday of each month ~~T~~the Department determines the EPf using the spot ~~base~~ price per barrel for West Texas Intermediate (WTI) crude oil posted in the commodities and futures section of the Wall Street Journal. This spot price is averaged with spot prices posted for the previous three Mondays to establish the EPf. ~~on the first working day of each week, using postings from the commodities and futures section of the Wall Street Journal for West Texas Intermediate (WTI) crude using the spot price for that date as a basis.~~

   b. The EPf remains in effect until the first Monday of the following month and is used for regular partial estimates closed before the first Monday of the following month.

   ~~b. A conversion factor of 42 gallons per barrel is used.~~

2. ~~Fuel Contract~~ Base Price for fuel (~~C~~BPf): The contract base fuel price, equal to the EPf in effect on the date of the contract bid opening. ~~The base price determined for the week during which the bid opening is held. The source of the price is the same as that used for the (EP).~~

3. Fuel ~~Usage~~ Factor~~s~~ (FF~~U~~): A combined diesel and gasoline usage factor established for purposes of calculating the Fuel Cost Adjustment.

   a. Table 1 ~~contains~~ shows the items of work ~~for which adjustments~~eligible for adjustment ~~may be made, and the fuel usage factors upon which the adjustment is based~~.

4. Fuel Cost Adjustment (FCA): The fuel cost adjustment in dollars determined in accordance with this article.

~~E~~C. Determining FCA~~Adjustments (AF)~~:

1. When the EPf changes more than 15 percent from the BPf, the provisions of this article become effective and remain in effect for the duration of the contract.

   a. The Engineer determines the FCA for each partial estimate after this provision becomes effective.

~~The Engineer computes the adjustments separately for each partial estimate period. The adjustment is determined based on appropriate items in Table 1 using the formula with the following constraints.~~

~~1. The Partial Estimate Base Price must change plus or minus 15 percent from the Contract Base Price before an adjustment is made, then add or deduct five percent per the formula.~~

2. ~~Engineer adjusts only~~FCA only applies to acceptable work performed on major contract items, as defined ~~by~~ in Section 00570, ~~or~~ and eligible items in Table 1 ~~that have~~with an individual value of more than $100,000, or as otherwise specified in Table 1, ~~or more~~ based on original contract quantities.

3. FCA does not apply to work added by change order.

~~3~~4. ~~Adjustments in compensation~~FCA may be ~~either plus~~ positive or ~~minus~~ negative depending on the changes or differences between the ~~Contract Base Price~~BPf and the ~~Partial Estimate Base Price~~EPf.

5. For work performed after the expiration of contract time and approved time extensions, the EPf will be limited to the lesser of:

   a. The EPf for the estimate period when the work was performed.

   b. The EPf for the last partial estimate period before the expiration of the contract time.

~~F. Work beyond Contract time: Adjustment will not apply to any work performed after the expiration of contract time plus approved time extensions.~~

~~H~~D. ~~Adjustment~~ FCA ~~F~~formula:

When the EPf is more than 15 percent ~~greater than~~above the ~~C~~BPf:

$$~~AF~~\ FCA = \frac{[(EPf - ~~C~~BPf) - 0.05\ ~~C~~BPf]\ Q\ (FF~~U~~)}{42}$$

When the EPf ~~less than~~is more than 15 percent below the ~~C~~BPf:

$$~~AF~~\ FCA = \frac{[(EPf - ~~C~~BPf) + 0.05\ ~~C~~BPf]\ Q\ (FF~~U~~)}{42}$$

Where:

~~EP = Partial Estimate Base Price per barrel (dollars)~~

~~CP = Contract Base Price per barrel (dollars)~~

Q = Quantity of ~~A~~acceptable ~~W~~work ~~P~~performed ~~on Item~~

FF~~U~~ = Fuel ~~Usage F~~factor for ~~that Item~~Q

~~AF= Adjustment for Fuel Costs in Dollars~~

42 = Conversion of ~~G~~gallons of fuel per ~~B~~barrel of ~~C~~crude

E. The Department determines the feasibility of proceeding with the remainder of the project and notifies the Contractor in writing if the project is to be terminated ~~I~~if the ~~Partial Estimate Base Price~~EPf increases by more than 50 percent from the ~~Contract Base Price~~BPf for an ~~adjustable bid~~eligible item of work~~, the~~

~~Department determines whether it is feasible for the remainder of the project to proceed, and notifies the Contractor in writing if the project is to be terminated~~.

Table 1
~~Adjustable~~ Items Eligible for FCA ~~and Fuel Usage Factors~~

Item of Work	Quantity of Work (Q)	~~Combined Diesel & Gasoline~~Fuel ~~Usage~~ Factor (F~~F~~U~~)~~
Roadway Excavation, Borrow, ~~Embankment,~~ Granular Borrow, Top Soil	Cubic Yard Ton	0.45 0.25
Underdrain Granular Backfill	Cubic Yard	1.16
Untreated Base Course	Ton Cubic Yard	0.84 1.63
Hot Mix Asphalt	Ton Cubic Yard	3.60 ~~7.20~~7.00
Open Graded Surface Course	Ton Cubic Yard	3.60 ~~7.20~~6.80
Stone Matrix Asphalt (SMA)	Ton Cubic Yard	3.60 ~~7.20~~6.80
Rotomilling Profile Rotomilling In-Place Cold Recycled Asphaltic Base Recycled Surface	Sq Yd-In Sq Yd Sq Yd Sq Yd	0.03
~~Cover Material Placed~~Chip Seal Coat	~~Ton~~Square Yard	~~0.64~~0.03
Portland Cement Concrete Pavement Lean Concrete Base Course	Sq Yd-In Sq Yd-In	0.214 0.048
Riprap	Cubic Yard	0.57
~~Structures~~ Bridges exceeding $500,000 (~~i~~Includes the following items: Structural Concrete, Piles, Reinforcing Steel, Prestressed Concrete Members, and Structural Steel) 36 inch and larger ~~P~~pipe ~~C~~culvert – combined items exceeding $200,000 ~~Special Pipe Culvert~~ ~~(Includes excavation for structures)~~ ~~Underdrains~~ ~~Right-of-Way Fence & Gates~~ ~~Seeding~~ ~~Concrete Small Structures~~ ~~Portland Cement Concrete~~ ~~Pavement Marking Paint~~ ~~Precast Concrete Barrier~~ ~~Guardrail~~	$	0.038 ~~Gal~~

~~1.18~~1.13ASPHALT COST ADJUSTMENT ~~FOR ASPHALT MATERIALS~~

A. ~~This price~~Asphalt cost adjustment ~~provision~~ is intended to ~~minimize~~ limit the risk to the Contractor ~~due to~~from potential~~ly volatile~~ unstable asphalt price~~s fluctuations for asphalt materials~~ that might occur ~~throughout the duration of~~during the ~~C~~contract.

~~1. The Contractor may invoke this provision at any time during the Contract by written notice to the Engineer.~~

~~2. Department then adjusts future partial estimates. When this provision becomes effective it remains in effect for the duration of the Contract.~~

1. This provision is not intended to estimate actual quantities of asphalt used or compensate for actual price variations experienced by the Contractor.

~~1.~~ 2. The Department determines adjustments under the provisions of this article and presumes that the Contractor has relied on these provisions for adjustments when determining unit bid prices.

B. The Department adjusts the price of asphalt materials for acceptable work ~~done~~ performed on bid items that contain asphalt materials~~, including asphalt cement, liquid asphalt, and emulsified asphalt~~.

~~C. Department determines compensation adjustments under the provisions of this Section, and presumes that the Contractor has relied on these provisions for compensation adjustments when determining unit bid prices.~~

~~D~~C. Abbreviations and Terms ~~for calculating adjustments for asphalt materials are as follows~~:

1. ~~Asphalt Partial~~ Estimate ~~Base~~ Price for asphalt (EP~~a~~): The ~~average of all the base~~ asphalt price~~s determined during~~established for the partial estimate period.
   a. ~~On the first working day of each week,~~ On the first Monday of each month the Department determines the ~~base price per barrel for crude~~EPa using the spot price per barrel for West Texas Sour (WTS) crude oil posted in the commodities and futures section of the Wall Street Journal. This spot price is averaged with spot prices posted for the previous three Mondays to establish the EPa.~~oil using postings from the commodities and futures section of the Wall Street Journal for West Texas Sour (WTS).~~
   b. The EPa remains in effect until the first Monday of the following month and is used for regular partial estimates closed before the first Monday of the following month.

   ~~b. A conversion factor of 5.6 barrels per ton is used.~~
2. ~~Asphalt Contract~~ Base Price for asphalt (~~C~~BPa): The contract base asphalt price, equal to the EPa in effect on the date of the contract bid opening.

~~The base price determined for the week during which the bid opening is held is the Contract Base Price. The source of the price is the same as that used for the (EP).~~

3. Asphalt Cost Adjustment (ACA): The asphalt cost adjustment in dollars determined in accordance with this article.

~~E~~D. Determining ~~Adjustments (AF)~~ACA:

1. When the EPa changes more than 15 percent from the BPa, the provisions of this article become effective and remain in effect for the duration of the contract.
   a. The Engineer determines the ACA for each partial estimate after this provision becomes effective for work performed after 120 calendar days of the contract bid opening date.
2. ACA does not apply to any work performed within 120 calendar days of the contract bid opening date.
3. ACA does not apply to work added by change order.
4. ACA may be positive or negative depending on the changes or differences between the BPa and the EPa.
5. For work performed after the expiration of contract time and approved time extensions, the EPa will be limited to the lesser of:
   a. The EPa for the estimate period when the work was performed.
   b. The EPa for the last partial estimate period before the expiration of the contract time.

~~The Engineer computes the adjustments separately for each partial estimate period. The adjustment on each item is determined using the formula with the following constraints.~~

~~1. The Partial Estimate Base Price of asphalt materials must change plus or minus 15 percent from the Contract Base Price before an adjustment is made, then add or deduct 5 percent per the formula.~~

~~2. Adjustments in compensation may be either plus or minus depending on the differences between the Contract Base Price and the Partial Estimate Base Price.~~

~~F. Work beyond Contract time: Adjustment will not apply to any work performed after the expiration of contract time plus approved time extensions.~~

~~G. Upward Ceiling:~~

~~If the Partial Estimate Base Price increases by more than 50 percent from the Contract Base Price for an adjustable bid item, the Department determines the feasibility for proceeding with the remainder of the project and notifies the Contractor in writing if the project is to be terminated.~~

~~H~~E. ~~Adjustment~~ ACA Formula:

When the EPa ~~greater than~~is more than 15 percent above the ~~C~~BPa:

~~AF~~ ACA = [(EPa - ~~C~~BPa) - 0.05 ~~C~~BPa] (5.6) ~~Q~~T

When the EPa ~~less than~~is more than 15 percent below the ~~C~~BPa:

~~AF~~ ACA = [(EPa - ~~C~~BPa) + 0.05 ~~C~~BPa] (5.6) ~~Q~~T

Where:

~~EP~~	~~=~~	~~Partial Estimate Base Price per barrel (dollars)~~
~~CP~~	~~=~~	~~Contract Base Price per barrel (dollars)~~
~~Q~~ T	=	~~Quantity in t~~Tons of ~~A~~asphalt ~~Materials~~ used
~~AF~~	~~=~~	~~Adjustment for Asphalt Costs in dollars~~
5.6	=	Conversion of ~~B~~barrels of crude oil per ton of ~~A~~asphalt

The Engineer ~~calculates~~ determines ~~product that will be~~Q T ~~in the above equation for the following~~as follows:

1. For PG asphalt binders
   a. Use the target percentage of asphalt binder in the approved mix design for the quantity of accepted material for:
      1) ~~HMA (Hot Mix Asphalt)~~Hot Mix Asphalt (HMA)
      2) Stone Matrix Asphalt (SMA)
   b. Use the quantity of accepted asphalt binder for:
      1) Open-Graded Surface Course (OGSC)

   ~~Open-Graded Surface Course~~
2. For Emulsified Asphalts, use the residual asphalt calculated from the quantity of accepted material.

   ~~Emulsified Asphalts~~

   ~~Cutback Asphalts~~
3. For Cutback Asphalts, use the quantity of accepted material.

F. The Department determines the feasibility of proceeding with the remainder of the project and notifies the Contractor in writing if the project is to be terminated if the EPa increases by more than 50 percent from the BPa for an eligible item of work.

PART 2 PRODUCTS Not used

PART 3 EXECUTION Not used

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: **John Butterfield, Karl Verhaeren**
Title/Position of preparer: **Region Two Materials Engineer, Engineer for Construction**
Specification/Drawing/Item Title: Embankment, Borrow, and Backfill
Specification/Drawing Number: 02056

Enter appropriate priority level:
(See last page for explanation) **3**

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web. (http://www.udot.utah.gov/index.php/m=c/tid=303)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

The motivation for this change was simply better organization of similar and related information in one place. This section replaces sections 02056, 02061, 02324, and 02330. When initially distributed for review, the change was to also include the replacement of section 02332 – Embankment for Bridge. After some discussion with Structures personnel, it became apparent that modifications to the existing standard for this section are anticipated and it was determined to exclude section 02332 from this change and leave as a separate section.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

As follows:

Section 02056: ~~Common Fill~~Embankment, Borrow, and Backfill

#	**020560005**	**Borrow (Plan Quantity)**	**Cubic Yard**

#	**020560010**	**Borrow**	**Ton**
In final position			

#	**020560015**	**Granular Borrow (Plan Quantity)**	**Cubic Yard**
In final position			

#	**020560020**	**Granular Borrow**	**Ton**
In final position			

#	**020560025**	**Granular Backfill Borrow (Plan Quantity)**	**Cubic Yard**
In final position			

#	**~~020560040~~**	**~~Sand~~**	**~~Ton~~**

#	**~~020560050~~**	**~~Clay~~**	**~~Ton~~**

~~Section 02061: Select Aggregate~~

#	**~~02061001002~~0560060**	**Free Draining Granular Backfill ~~Borrow~~**	**Ton**

#	**~~02061002002~~0560070**	**Free Draining Granular Backfill ~~Borrow~~ (Plan Quantity)**	**Cubic Yard**

#	**~~020610030~~**	**~~Underdrain Granular Backfill~~**	**~~Ton~~**

#	**~~020610040~~**	**~~Underdrain Granular Backfill (Plan Quantity)~~**	**~~Cubic Yard~~**

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at http://www.udot.utah.gov/index.php/m=c/tid=659 for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Sent to the AGC on October 10, 2006.
No comments received as of November 1, 2006.

ACEC Comments: (Use as much space as necessary.)

Sent to the ACEC on October 10, 2006.
No comments received as of November 1, 2006.

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

~~Construction~~ District Engineers

Sent to the District Engineers, Resident Engineers, and Standards Committee members on October 10, 2006.

No comments received as of November 1, 2006.

Comments received from Lonnie Marchant were received and incorporated in the submitted document.

Contractors (Any additional contacts beyond “C” above.)

Suppliers

Consultants (as required) (Any additional contacts beyond "C" above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Sent to the FHWA on October 10, 2006.
No comments received as of November 1, 2006.

Others (as appropriate)

After discussion with Ray Cook (UDOT Structures) it was determined to not include Section 02332 – Embankment for Bridge with this section.

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T ~~Guide~~Requirements)

As follows:

MINIMUM SAMPLING AND TESTING REQUIREMENTS

A. Contractor Submittals
- **1. Source Suitability**
- **2. Sieve analysis, AASHTO T 11/T 27**
- **3. Soil Classification, AASHTO M 145**
- **4. Maximum Dry Density and Optimum Moisture Determination AASHTO T 99 Method D or AASHTO T 180 Method D for A-1 soils.**
- **5. Resident Engineer approves submittal prior to material being incorporated into the project.**

B. Material for Embankment and Backfill placements
- **1. Soil Classification, AASHTO M 145**
  - **a. Sampled from the grade after processing prior to compaction, AASHTO T 2**
  - **b. One test per source / soil type, one test minimum per 20,000 yd^3 thereafter.**

C. Free Draining Granular Backfill
- **1. Sieve analysis (gradation) obtained from the grade after processing, AASHTO T 2, T 27/T 11. A minimum of:**
  - **a. Five determinations when daily production exceeds 2500 tons.**
  - **b. Four determinations when daily production is between 1500 to 2500 tons.**
  - **c. Three determinations when daily production is less than 1500 tons.**

D. Compaction
- **1. Maximum Dry Density and Optimum Moisture Determination in conjunction with soil classification or sieve analysis, AASHTO T 99**

Method D or AASHTO T 180 Method D for A-1 soils.

a. For embankments up 100,000 yd^3, one randomly selected test per 20,000 yd^3 for each layer, one per 50,000 yd^3 for each layer, thereafter.

2. In-place density of embankment and subgrade, AASHTO T 310

a. A lot equals one production day.

b. A lot is divided into equal sublots not to exceed 3000 tons or 200 yd^3, 6000 yd^3 in cut sections.

c. A minimum of one randomly located determination per sublot.

3. In-place density of backfill placements, AASHTO T 310.

a. A lot equals 200 yd^3 or less and not more than one pipe culvert or small structure.

b. A minimum of four randomly located determinations per lot.

4. Material considered too rocky to apply the correction for coarse particles, 30% cumulatively retained on the ¾" sieve, AASHTO T 224.

a. Gradation is reported on T 348 weekly report.

b. Compaction is visually inspected. Document method and equipment used for placement, appearance of gradation uniformity, moisture content, compactive effort, and final appearance.

E. Document on T 348 weekly report.

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

N/A

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

N/A

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

N/A

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

N/A

3. Life cycle cost.

N/A

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

No cost change anticpated. The benefit of the specification change is that the Contractor and UDOT personnel will be able to find most of the materials related specifications in one place.

H. Safety Impacts?

N/A

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

N/A

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

Supplemental Specification
2005 Standard Specification Book

SECTION 02056

EMBANKMENT, BORROW, AND BACKFILL

Delete Section 02056, 02061, 02324, and 02330 in their entirety and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and procedures for construction of embankment and backfill.

1.2 RELATED SECTIONS

A. Section 01455: Material Quality Requirements

B. Section 01741: Final Cleanup

C. Section 02231: Site Clearing and Grubbing

D. Section 02317: Structural Excavation

E. Section 02332: Embankment for Bridge

~~D.~~F. Section 02912: Topsoil

~~1.2~~1.3 REFERENCES

A. AASHTO M 145: Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes

B. AASHTO T 11: Materials Finer than 75 μm (No. 200) Sieve in Mineral Aggregates by Washing

C. AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates

D. UDOT Minimum Sampling and Testing Requirements

~~1.3~~1.4 SUBMITTALS

A. ~~Prior to~~Before delivering material to ~~site~~the project, submit:
   1. Supplier and source of materials
   2. Gradation analysis AASHTO T 27 / T 11
   3. Soil ~~C~~classification ~~where~~ when applicable AASHTO M 145

~~1.~~1.5 ACCEPTANCE

A. Acceptance of material is in accordance with UDOT Minimum Sampling and Testing Requirements.

B. Engineer reserves the right to select and test material randomly from any location at the construction site.

C. Density Requirement: Acceptance is on a lot-by-lot basis when average density is not less than 96 percent of maximum laboratory density, and no single determination is lower than 92 percent.

D. Remove any material found defective and replace with acceptable material at no additional cost to the Department.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide materials free of contamination from chemical or petroleum products for embankment and backfill placements. Materials may include recycled Portland Cement concrete.

2.2 BORROW

A. Classifications A-1-a through A-4. Meet AASHTO M 145

2.3 GRANULAR BORROW

A. Classification A-1-a. Meet AASHTO M 145

B. Non-plastic, well-graded, 3-inch maximum

2.4 GRANULAR BACKFILL BORROW

A. Classification A-1-a. Meet AASHTO M 145

B. Non-plastic, well-graded, 2-inch maximum

2.5 FREE DRAINING GRANULAR BACKFILL

A. Meet the following gradation:

Table 1

Free Draining Granular Backfill Gradation	
Sieve Size	**Percent Passing**
1-1/2 inch	100
1 inch	95 to 100
1/2 inch	25 to 60
No. 4	0 to 10

~~**2.6UNDERDRAIN GRANULAR BACKFILL**~~

~~A.Meet one of the following gradations as required:~~

~~**Table 2**~~

~~Underdrain Granular Backfill Gradation~~		
~~**Sieve Size**~~	~~**Type A Percent passing**~~	~~**Type B Percent passing**~~
~~2-1/2 inches~~	~~100~~	
~~1-1/2 inch~~	~~80 - 100~~	~~100~~
~~1/2 inch~~	~~55 - 75~~	~~50 - 80~~
~~No. 4~~	~~30 - 60~~	~~30 - 65~~
~~No. 40~~	~~10 - 25~~	~~10 - 30~~
~~No. 200~~	~~0 - 3~~	~~0 - 3~~

2.6 EMBANKMENT FOR BRIDGE

A. Refer to Section 02332.

PART 3 EXECUTION

3.1 PREPARATION

A. Complete clearing and grubbing and stripping and stockpiling topsoil before placing embankment. Refer to Sections 02231 and 02912.

B. Excavate and dispose of unsuitable material as directed by the Engineer.

3.2 EMBANKMENT PLACEMENT

A. Place roadway excavation or borrow in embankment section with the highest quality material in the top portion of the embankment.

B. Scarify and compact the top 8.0 inches of the surface to at least 90 percent of maximum laboratory density when the embankment height is 6.0 ft or less and the underlying ground consists of loose material.

C. Break and scarify all underlying road surfaces in so that pieces do not exceed~~ing~~ 3.0 square feet.

D. Maintain drainage.
   1. Grade and maintain the roadway to ensure adequate drainage.
   2. Maintain pipe culverts and drainage ditches, or provide temporary facilities when interrupting irrigation systems, sewer, underdrainage, etc.

E. Place an initial layer to act as a working platform over soft, wet ground when approved by the Engineer.
   1. Density specifications do not apply to the working platform.
   2. Meet density requirements for embankment placed above the working platform.

F. The Engineer inspects and accepts the working platform or foundation before embankment is placed.

G. Spread embankment materials uniformly in layers not exceeding 1.0 ft (uncompacted depth) and compact to an average of 96 percent maximum laboratory density before placing the next layer. Reduce the lift thickness if tests show unsatisfactory density.

H. Finish subgrade surface within ±0.1 ft of line and grade.

I. Do not use rock or pavement materials over 3.0 ft in any dimension. Distribute so space exists for placing and compacting embankment material between large rocks or pavement materials.

J. Do not place large rock within 1.0 ft of the subgrade surface. Do not allow rocks to protrude above the subgrade surface.

K. Do not use compacting equipment that causes shear failure in the embankment.

3.3 GRANULAR BORROW AND BACKFILL PLACEMENT

A. Finish granular borrow surface within ±0.1 ft of line and grade.

B. Structural Backfill Placement (includes bridges, foundation, box culverts, pipe culverts, drains and other structures)

1. Place suitable backfill material in structural backfill sections. Refer to Sections 02317 and 02332.
   ~~a. When suitable backfill material is not available from roadway excavation, import suitable backfill material.~~
   ~~b~~a. Use granular backfill borrow when specified.
2. Use appropriate compaction equipment adjacent to abutments, backwalls, approach slabs, wing walls, retaining walls, and other structures.
3. Compact backfill material in 6-inch layers to a 96 percent density.

C. ~~Underdrain~~ Free Draining Granular Backfill
1. Excavate a trench 3 inches below the underdrain pipe flow-line. Widen to 2 feet plus the outside diameter of the underdrain pipe.
2. Place ~~underdrain~~ free draining granular backfill in the trench and compact the bottom 3 inches with two passes of a vibratory roller.
3. Back fill to 12 inches above top of pipe with ~~underdrain~~ free draining granular backfill.
4. Compact backfill material in 6-inch layers to a 96 percent density when placing ~~the underdrain~~ under a roadway.

3.4 LIMITATIONS

A. Requirements when working during freezing or snowy conditions:
1. Do not place embankment on frozen or snow-covered areas.
2. Do not deliver or use frozen material in embankments.
3. Remove snow and frozen material from embankments, foundations, and borrow areas, and furnish embankment material that can be compacted to the specified density.
4. Remove, waste, and replace frozen embankment material at no additional cost to the Department.
5. Measure wasted material and provide quantities to the Engineer.

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: W. Scott Jones (and Larry Montoya)
Title/Position of preparer: Signal & Lighting Engineer
Specification/Drawing/Item Title: Traffic Signal Specification & Pedestrian Signal Assembly Drawing
Specification/Drawing Number: 02892 & SL 09

Enter appropriate priority level:
(See last page for explanation) **3**

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web. (http://www.udot.utah.gov/index.php/m=c/tid=303)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

For 02892, the spec has been completely updated to reflect current practices and to remove conflicts with recently updated standard drawings.

For SL 09, this drawing has been updated to reflect current requirements for pedestrian features as specified in ADA requirements and the MUTCD.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Measurement and Payment does not change with these updates.

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at http://www.udot.utah.gov/index.php/m=c/tid=659 for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Email was sent – no response has been received.

ACEC Comments: (Use as much space as necessary.)

Email was sent – no response has been received.

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers

Contractors (Any additional contacts beyond “C” above.)

Signal contractors from Cache Valley Electric, Sorenson Construction, and Hamilton Brothers have received advanced copies and have provided favorable feedback.

Suppliers

Suppliers have been contacted, and have provided samples, as part of securing a procurement contract to purchase the new style pedestrian push button, frame, and sign shown on SL 09.

Consultants (as required) (Any additional contacts beyond "C" above.)

Signal design consultants, including Horrocks, PEC, Carter Burgess, Lochner, & JUB have successfully utilized information as shown on these updates in recent project packages.

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Email was sent – no response has been received.

Others (as appropriate)

UDOT Traffic & Safety at the complex as well as UDOT Traffic Engineers and UDOT Maintenance at each region have contributed to making these changes and updates.

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

   None.

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

   None.

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

   The new pedestrian button, as specified, will cost twice as much as the old button (about $70 instead of $35). We expect to recover that cost because the button will last approx three times as long and is more durable, so it requires less maintenance.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

3. Life cycle cost.

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

The new pedestrian button, as specified, will cost twice as much as the old button (about $70 instead of $35). We expect to recover that cost because the button will last approx three times as long and is more durable, so it requires less maintenance.

H. Safety Impacts?

For SL 09, this drawing has been updated to reflect current requirements for pedestrian features as specified in ADA requirements and the MUTCD.

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

For SL 09, this drawing was pulled from consideration at a standards committee meeting six months ago in order to address concerns by FHWA that our current practices did not comply with the MUTCD. The drawing, as submitted now, is fully compliant with ADA requirements and the MUTCD.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

Supplemental Specification
2005 Standard Specification Book

SECTION 02892

TRAFFIC SIGNAL

Delete Section 02892 in its entirety and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and procedures for installing traffic signals.

B. Materials and procedures for installing traffic counting loop detectors.

1.2 RELATED SECTIONS

A. Section 02741: Hot Mix Asphalt (HMA)

B. Section 02748: Prime Coat/Tack Coat

C. Section 02891: Traffic Signs

D. Section 03055: Portland Cement Concrete

E. Section 03211: Reinforcing Steel and Welded Wire

F. Section 03310: Structural Concrete

G. Section 03575: Flowable Fill

H. ~~Section 13554M: Polymer Concrete Junction Box~~

1.3 REFERENCES

A. ~~AASHTO M 111: Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products~~

B. ASTM A 123: Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

C. ASTM A 325: Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

D. ASTM A 307: Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

E. ASTM A 570: Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality

F. ASTM B 85: Aluminum-Alloy Die Castings

~~G. ASTM B 117: Operating Salt Spray (Fog) Apparatus~~

H. ASTM B 766: Electrodeposited Coatings of Cadmium

I. ASTM D 638: Tensile Properties of Plastic

J. ASTM D 2240: Rubber Property-Durometer Hardness

K. ASTM D 3005: Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape

K. ASTM F 1554:

L. American Iron and Steel Institute (AISI)

M. American National Standards Institute (ANSI)

N. Electric Utility Service Equipment Requirements Committee (EUSERC)

~~O. Electronics Industries Association (EIA)~~

P. International Municipal Signal Association (IMSA) Standards

~~Q. Institute of Electrical and Electronics Engineers (IEEE)~~

~~R. Institute of Traffic Engineers (ITE), Technical Reports~~

~~S. Military Specifications~~

T. National Electric Code (NEC)

U. National Electrical Manufacturers Association (NEMA)

V. Pedestrian Traffic Control Signal Indicator (PTCSI) Standards

W. Rural Electrical Association (REA) Bulletin

X. Underwriters Laboratory (UL)

Y. Vehicle Traffic Control Signal Head (VTCSH) Standards

~~Z. 3M - 8982/Gel~~

1.4 SUBMITTALS

A. Certified test report of wire compliance as specified. IMSA 20-1, 50-2, 51-1, 51-3, 51-5, 51-7, 60-6.

B. Submit samples of materials for approval when requested.

C. Submit two copies of the following within 15 days after receiving notice to proceed:
   1. List of equipment and materials (name of manufacturer, size, and identification number).
   2. Detailed shop drawing, wiring diagrams, and certifications.
   3. Manufacturers' warranties, guarantees, instruction sheets, and parts lists.

1.5 ACCEPTANCE

A. Signal Warranties and Guarantees
   1. The notice of acceptance for traffic signal work is not given until six months after the date of completion of punch list items.
   2. During this period, all manufacturer's warranties and guarantees on Contractor-furnished electrical and mechanical equipment are enforced.
   3. At the end of the period and after all electrical and mechanical defects within the scope of warranties and guarantees are corrected, the Engineer makes written acceptance of the work completed and relieves the Contractor of further responsibility for that portion of the project.
   4. Partial acceptance does not void or alter any terms of the Contract

B. The six-month warranty period for signal work does not affect the processing of a semi-final estimate when the Contract is 95 percent or more complete, or after completion of work on the project.

C. Detector Loop Circuit: Conduct the following acceptance tests before and after backfill for approval by the Engineer.
   1. Measure and report in ohms, the continuity of each loop.
   2. Value to be within 5 percent of calculated values.
   3. Loop Resistance Formula: $R_t = R_l + R_d$

Where:

R_t= Resistance of loop as measured at pull box.

R_l= Resistance of loop lead in wire (from the loop to junction box). Equal to 0.002525 ohms per foot, (times 2) measured from loop to pull box splice point.

R_d = Resistance of Loop = $P \cdot T \cdot R_c$ (See Loop Resistance Table below)

P = Perimeter of loop in feet

T= Number of turns in the loop.

R_c= Resistance of #14 AWG copper wire per foot equals 0.002525 ohms.

Table 1

Loop Resistance			
Loop Type			**R_d Loop Resistance (ohms)**
Width (ft)	**Length (ft)**	**Turns**	
5	6	4	0.22
5	10	4	0.32
6	Circular	4	0.19
6	Circular	5	0.24
6	6	4	0.24
6	10	4	0.32
6	12	4	0.36
6	14	3	0.30
6	16	3	0.33

2. Measure and report each loop's insulation resistance. Minimum acceptable reading measured between the loop conductor and ground is 450 MΩ or greater, when tested with a 500 V megger meter.
4. Measure and report the inductance of each loop. Acceptable inductance readings are greater than 90 μH for individual loops, and less than 1000 μH for a 4 loop group.

D. Signal Power Circuits:

1. Measure and report continuity of bonding conductors by testing between AC+ supply and metal poles: A 1000 Watt load, tested to each pole frame must incur less than 2 Volts drop, measured from the pole to the cabinet neutral conductor.
2. Insulation resistance of supply conductors measured to ground will have not less than 100 MΩ of leakage (500 V megger meter).

E. Video Detection Circuit: Demonstrate each video detection circuit operates per manufacturer's specifications.

PART 2 PRODUCTS

2.1 MATERIALS

A. Use electrical components as listed and defined by the National Electric Code (NEC).

2.2 SIGNAL POLE AND TRAFFIC SIGNAL LIGHT SUPPORT ARM

A. Post Mounted Signals Pole:.
   1. Steel, as specified. ASTM A570, Grade 33.
      Allowable stresses: $F_b = 21{,}750$ psi $(0.66F_y)$
      $F_V = 10{,}900$ psi $(0.33\ F_y)$
   2. Galvanized as specified. AASHTO A123.
   3. Wind load: 80 mph wind with 105 mph gusts.

B. Foundation:
   1. Concrete: Class AA(AE) Concrete. Refer to Section 03055.
   2. Reinforcing steel: Coated steel. Refer to Section 03211.

2.3 BOLTS, NUTS AND HARDWARE

A. Anchor Bolts and Nuts:
   1. Steel as specified. Signal, CCTV, and Luminaire Poles use ASTM F 1554 Grade 55; Signal Cabinet use ASTM A307.
   2. Zinc-plated or galvanized, as specified.
      a. Zinc-plated as specified. ASTM B766.
      b. Galvanized steel: ASTM A123.
   3. Nuts: Free running by hand for total thread length of bolt.

B. Slip Bolts as specified.
   1. Zinc plated: ASTM B766.
   2. Steel: ASTM A325.

2.4 WIRE

A. Copper, as specified. International Municipal Signal Association (IMSA)

B. Size as specified. American Wire Gauge (AWG)

C. Service Cable:
   1. Single-conductor, as specified. Types RHH-USE-RHW.

D. Interconnect cable:
   1. Twisted pair filled shielded cable, as specified. IMSA 60-6.
   2. Single mode fiber optic cable, as specified.

E. Signal Cable:
   1. Multi-colored cables, as specified. IMSA 20-1

F. Bonding/Grounding System Wire:
   1. Solid, bare, soft-drawn, copper wire, as specified. Sized to meet NEC 250-1.

G. Detector Lead-In Wire (homerun): as specified. IMSA 50-2.

H. Detector Loop Wire:
   1. PVC Sensor Loop Wire – No. 14, single-conductor, stranded wire as specified. IMSA 51-3.
   2. Saw Cut Sensor Loop Wire – No. 14, single-conductor, stranded wire encased in a polyethylene tube as specified. IMSA 51-7.

I. Commercially Manufactured Preformed Loop:
   1. Highly abrasion-resistant alloy cover with high tensile strength braided synthetic fiber reinforcement, max. O.D. of 3/8 inch.
   2. Withstand minimum pressure of 1400 psi.
   3. Good flexibility over a wide temperature range and rated to withstand the temperatures of an asphalt overlay project.
   4. Superior resistance to oil, gasoline, salt, moisture and impact.
   5. Loops shall be individually marked as to the direction of the wire turns.
   6. Manufacturer to provide minimum 15 year guarantee.

J. Splice Sealing: Rural Electrical Association (REA) Bulletin 17551-100.
   1. Insulate conductors individually and encapsulate with mastic rubber pads and over wrap with vinyl electric tape. Overcoat completed splice with waterproof sealant. ASTM D3005, Type I or II. UL 510.

K. Color Coding Tape:
   1. Vinyl electric tape, as specified. UL 510.

L. Video Detection Circuit:
   1. Video Detection/Camera Power Circuit Cable: As specified per manufacturer requirements.

2.5 VEHICLE TRAFFIC SIGNAL HEAD

A. Comply with VTCSH standards. Refer to SL series Standard UDOT Drawings.

B. Signal Head Assembly:
   1. 12-inch vehicular signal head as specified.
   2. Separate, interchangeable, and expandable without tie rods.
   3. Stainless steel bolts, screws, hinge pins, lugs, and hardware.
   4. Die-cast aluminum parts, including the doors, as specified: ASTM B 85. Clean, smooth parts free from flaws, cracks, blowholes, or other imperfections.
   5. Perimeter door gasket to ensure moisture and dust resistant seal.
   6. Mounting hardware for securing LED module to door housing.
   7. Integrally round serrated boss openings in the top and bottom of each section that accepts a standard 1.5-inch pipe mounting or universal bracket mounting hardware. Capable of adjusting a full 360 degrees around a vertical axis.
   8. 6-position wiring terminal strip.
   9. Tunnel visor securely mounted to the door at a minimum of four attachment points.
   10. Powder coat all exterior and interior surfaces of the signal housing, door, and outside of visor in Highway Yellow. Inside of visor is painted flat black.

C. Optical Unit:
   1. Mount LED Ball and Arrow Vehicle Signal Module to door housing for unrestricted easy access.

D. Back Plate:
   1. Constructed with minimum 18-gage aluminum.
   2. Provide louvered design to reduce wind loading on mast arm structure.
   2. Both sides primed and painted flat black.
   3. Designed to be attached to the signal head used.

2.6 PEDESTRIAN SIGNAL HEAD

A. Comply with PTCSI standards. Refer to SL series Standard UDOT Drawings.

B. Signal Head Assembly:
   1. Provide 16-inch by 18-inch housing, swing down door assembly, and LED module.
   2. Moisture and dust resistant.

3. Die cast, single piece aluminum with 1-1/2 inch top and bottom openings, and integrally cast shurlock boss. Use stainless steel screws and assembly hardware.
4. Swing down door assembly capable of being opened without tools, constructed from single piece aluminum alloy, die cast with two hinge lugs at the bottom and two latch slots at the top of the door. Universal housing with interchangeable castings for hinge and latch hardware is acceptable.
5. 3-position wiring terminal strip.
6. Provide electrostatic apply synthetic enamel as specified. Gloss black case and doorframe. Oven-cure finish for a minimum of 20 minutes at 350 degrees F.

C. Optical Unit:
1. Mount LED Pedestrian Signal and Count Down Pedestrian Signal Modules to door housing for unrestricted easy access.

2.7 PEDESTRIAN BUTTONS

A. Refer to SL series Standard UDOT Drawings.

B. Pedestrian Button with LED Indicator
1. Provide pedestrian button with standard 4-bolt circle (2.60-inch +/– 0.05-inch diameter).
2. Provide ADA compliant assembly with a 2 inch diameter stainless steel actuator, rated for 100,000,000 actuations, requiring between 1 and 3 pounds of force to actuate.
3. Provide a low-movement (maximum movement of 12/1000 of an inch), pressure activated, tamper-proof, highly vandal resistant button.
4. Provide assembly with solid state electronic Piezo switch rated for 100 million cycles with no moving plunger or moving electrical contacts.
5. Provide assembly with internal circuitry with a resetting switch so as to avoid held calls to the signal controller.
6. Provide assembly with built in surge protection, with all switch electronics sealed within the cast aluminum housing. Ensure all supporting circuitry is enclosed within the button with wiring to the pushbutton terminated on two screw terminals.
7. Provide a rain-tight gasket to seal between the button assembly and the frame.
8. Provide assembly that is designed to prevent water and ice from entering or accumulating on or in the button, and that is capable of protecting the button cap from side impacts.
9. Provide button that gives feedback to the user that a call has been made in both of the following forms:

a. Audible beep when button is pushed.
b. Momentary LED light as the button is pushed, or LED light stays on for 3-5 seconds if the button is pushed and held closed.

C. Pedestrian Push Button Frame
1. Provide cast aluminum frame, powder coated black, capable of supporting push button and a 9 inch x 12 inch sign, with the following characteristics:
a. Frame attaches to the pole using (2) ¼ inch-20 x 1.5-inch hex head brass bolts attached behind the sign.
b. Frame is additionally supported using adjustable staves.
c. Sign attaches above the button using 8-32 stainless steel Allen-head screws.
d. Cable guide extends through a 7/8 inch diameter mounting hole in the support pole to channel wiring to the button.

D. Pedestrian Push Button Sign
1. Provide a 9 inch x 12 inch sign with corner radii that allow the sign to fit completely within the frame.
2. Provide a two-sided sign with markings that are in accordance with MUTCD Type R10-4b; one side of the sign with a right arrow, and the opposite side a left arrow.
3. Provide sign fabricated from aluminum with Type III High Intensity sheeting with standard 8-32 clearance holes or eyelets for mounting.

2.8 LED SIGNAL MODULES

A. LED Signal Module Standards:
1. Use new LED vehicle signal modules that meet current VTCSH standards.
2. Use new LED pedestrian and countdown signal modules that meet current PTCSI standards.

B. Physical Requirements:
1. Use modules that fit into traffic signal housing without modification to the housing.
2. Use retrofit replacement modules that only require removal of the existing optical unit components, i.e., lens, lamp module, gaskets, and reflector.
3. Watertight and dust resistant module that securely fits the housing door and wire pigtails for direct connection to wiring terminal strip. Screw-in modules are not acceptable.
4. Provide tinted lens for all LED modules.
5. Use LED modules that have the appearance of an incandescent traffic signal lens and wide angle viewing capability.

C. Additional Requirements for Pedestrian Signal Modules:
1. Provide 9-inch countdown numerals when specified.

2. Ensure symbol message blanks out under ambient light conditions when the pedestrian symbols are not active.
3. Provide circuitry that isolates man/hand symbols so they cannot be displayed at the same time.

D. Manufacturer Warranty:
1. Provide the following minimum warranty provisions:
a. Replace or repair module if it fails to function as intended due to workmanship or material defects within the first 84 months from the date of delivery. If repaired, the warranty covers all parts and labor necessary or incidental to the repair.
b. Ensure the period of guarantee coverage, not less than the manufacturers usual and customary guarantee period. Provide all guarantees that are customarily issued by the Bidder and/or manufacturer to the State of Utah.
c. UDOT, or their appointee, may elect to make minor repairs, with the consent of the manufacturer. Make all other repairs under warranty by the manufacturer. The manufacturer bears all costs including labor, parts, and shipping charges.
d. Replace or repair all LED Vehicle Traffic Signal Modules that exhibit luminous intensities less than the minimum values specified in Article H-1a within the first 60 months of the date of delivery.

2.9 ELECTRICAL CONDUIT

A. Conduit and fittings:
1. Schedule 40 PVC rated at 190 degrees F as specified. NEMA TC-2, TC-3. UL Listed.
2. Rigid steel as specified. UL 6.
3. Galvanized as specified. ANSI C80.1.

B. Steel Casing:
1. Provide smooth steel casing with a minimum ¼-inch wall thickness and diameter as specified.

2.10 VEHICLE DETECTION

A. Refer to SL series Standard UDOT Drawings.

B. Video Detection:
1. State-furnished video detection equipment as specified. Refer to UDOT Accepted Products List for approved manufacturers.

C. Induction Loop Detection:
   1. PVC or preformed loops:
      a. Use for presence detection, traffic queue detection, and dilemma zone detection.
   2. Saw Cut loops:
      a. Use for presence detection, traffic queue detection, and dilemma zone detection.
      b. Use circular loop saw or standard pavement saw. Square loops require corner cuts. Avoid saw angles greater than 45 degrees.

D. Radar Detection:
   1. Use for dilemma zone detection for typical high-speed approaches, and advance signal warning systems.
   2. Use for vehicle counting.

2.11 LOOP SEALANT

A. Refer to SL series Standard UDOT Drawings.

B. Traffic loop embedding sealant:
   1. Isophthalic, acid-based, unsaturated, polyester resin.
   2. With sufficient adhesion, strength, and flexibility to:
      a. Withstand normal movement in asphaltic and concrete pavements
      b. Protect the loop wire from moisture penetration, fracture and shear.
   3. Cured sealant resistant to motor oils, gasoline, anti-freeze solution, brake fluid, and de-icing chemicals.
   4. Meet the physical property requirements in Table 2.

Table 2

Traffic Loop Embedding Sealant		
Physical Properties	**Test**	
Shore D Hardness	ASTM D 2240	50-65
Specific Gravity		1.13 - 1.20
Styrene Monomer, percent		28 - 32
Viscosity: Pa·s	Brookfield Model LVF #3 Spindle @ 60 rpm	0.7-0.9
Gel Time	MEK Peroxide 46-709	11 - 15 minutes
Tensile Elongation, % @ Break	ASTM D 638	15 minimum
Pot life, minimum		5 minutes
Tensile Strength	ASTM D 638	1200 psi

2.12 LUMINAIRE

A. General:
   1. Die-cast aluminum housing.
   2. Reflectors, sockets, mounting cradles, and clamps fitted to the upper housing.
   3. High temperature wiring.
   4. Luminaire weight and projected area within design loading limits.
   5. Refer to SL series Standard UDOT Drawings.

B. Ballast Assembly:
   1. Pre-wired on integral ballast with quick disconnect plugs mounted on a removable, hinged door.
   2. Multi-volt, multi-watt ballast.
   3. Provide correct ballast assembly for the specified lamp type:
      a. High-pressure sodium.
      b. Metal halide.

B. Optical Assembly:
   1. Formed aluminum reflectors with a chemically bonded, non-breakable, glass finish on both the inside and outside surfaces.

D. Mogul Base Socket:
   1. Adjustable with split-shell, tempered-brass lamp grips.
   2. Free-floating, spring loaded center contacts.
   3. Heat and impact-resistant glass prismatic refractors.

E. Mounting Adjustment:
   1. Standard Highway Luminaire (Cobra Head):
      a. Ten degrees above horizontal for the reflector and refractor.
      b. Five degrees adjustment from vertical on the bracket arm.

F. Lamp:
   1. High pressure sodium lamp as specified:
      a. Clear uncoated lamp.
      b. Apparent color temperature of 2100 K.
      c. Rated-life of not less than 24,000 hours when used on a 10 hour per start duty cycle.
   2. Metal halide lamp as specified:
      c. Clear uncoated, pulse start lamp.
      d. Apparent color temperature of 3800 K.
      e. Rated-life of not less than 20,000 hours (400 Watt) or 10,000 hours (250 Watt) when used on a 10 hour per start duty cycle.

2.13 GROUND ROD

A. Copper-coated steel as specified.

B. ANSI/UL 467.

2.14 MESSENGER CABLE

A. 3/8 inch diameter galvanized, stranded steel cable.

B. Minimum breaking strength of 10,800 lbs. as specified.

C. ASTM A 123.

2.15 MOUNTING BANDS AND BUCKLES

A. As specified.

B. American Iron and Steel Institute, (AISI) Type 201.

2.16 POWER SOURCE

A. Refer to SL series Standard UDOT Drawings.

B. Pole Mounted Service:
   1. NEMA wet service rated service enclosure.
   2. Provide a manual Electrical Utility Service Equipment Requirements Committee (EUSERC) approved circuit closing link by-pass release meter socket.
   3. Other requirements as specified and as required by the local power company. Provide a product consistent with specifications for Underground Service Pedestal.

C. Underground Service Pedestal:
   1. Service Disconnect:
      a. Provide pedestal rated for 100-amp, 1-Phase 3-wire 120/240v service.
      b. Provide 200-amp utility landing lugs rated for 250 MCM wire.
      c. Provide pedestal that is split into an “un-metered” and a “metered” side.
      d. Provide plug in circuit breakers that are UL approved, industrial grade, and rated for 10K AIC minimum.

e. Provide one double pole 70-amp main circuit breaker labeled "Metered Main" and one single pole 40-amp circuit breaker labeled "Traffic Signal" with minimum capacity for four metered single pole circuit breakers. Ensure Traffic signal circuit breaker is secondary to the metered main breaker.

f. Provide one double pole 50-amp main circuit breaker labeled "Un-metered Main" and one double pole 20-amp circuit breaker labeled "Lighting" with minimum capacity for four un-metered double-pole circuit breakers. Ensure lighting circuit breaker is secondary to the un-metered main circuit breaker.

2. Provide pedestal that is pre-wired according to NEC and NEMA Specification with UL approved copper XHHW-2 cable bussing, fully rated. Ensure there are provisions for terminating to a ground rod.
3. Provide pedestal with UL 508 rating.
4. Provide self-standing NEMA 3R cabinet (direct burial pedestals are not acceptable) with gasket in place, fabricated of 0.120 inch minimum thickness anodized aluminum. Ensure all exterior components are rustproof. Ensure exterior has no exposed hardware except for handles.
5. Meet EUSERC requirements for all mounting hardware and installation details. Fit with EUSERC approved power meter base with manual link bypass.
6. Provide pedestal with service entrance, meter and distribution compartments with a corrosion resistant barrier to separate each compartment. Provide access panel or door with stainless steel piano hinges.
7. Provide cabinet with sealed window(s) of shatter resistant Lexan (or equivalent). Ensure the meter can be read from the front of the cabinet.
8. Ensure documentation is permanently and conveniently attached. Ensure documentation includes the manufacturer's name, address, phone number, a wiring diagram, date of manufacture, and all necessary information to order an identical pedestal and replacement parts.
9. Provide labels that are permanent (etched or engraved) and mechanically fastened to the cabinet. Label the front exterior of the cabinet "UDOT SIGNAL AND LIGHTING DISCONNECT"

2.17 FLOWABLE FILL

A. Refer to Section 03575.

2.18 HOT MIX ASPHALT

A. Half-inch maximum. Refer to Section 02741.

2.19 MAST ARM SIGNS

A. Provide sign fabricated from aluminum with Type III High Intensity sheeting (minimum). Refer to Section 02891.

PART 3 EXECUTION

3.1 PREPARATION

A. Conform to the National Electrical Code (NEC).

B. Coordinate State Furnished Materials:
   1. Pick up at the Department's Central Warehouse, 4501 South 2700 West, Salt Lake City, UT. Contact the warehouse to schedule a pickup.
   2. Pick up drop shipment materials at location specified.

C. Do not disconnect or remove an existing signal system until the replacement system is functioning.

D. Contact power company at least 30 days before the connection date, and verify the exact location, voltage, procedure, and materials required by the power company.

E. Pothole, locate, and expose any utility that will conflict with drilling, trenching, or boring work associated with placement of signal/pedestrian poles and conduit.

F. Reuse materials only as specified or as approved by the Engineer.

3.2 CONSTRUCT POLE FOUNDATION

A. Refer to SL series Standard UDOT Drawings.

B. Concrete: AA(AE) required. Refer to Section 03055.

C. Structural Concrete: Refer to Section 03310.

D. Reinforcing Steel and Welded Wire: Refer to Section 03211.

E. Do not weld reinforcing steel, anchor bolts, or conduit.
   1. Use tie wire to secure conduit.
   2. Use template to align and secure anchor bolts.

F. Place concrete directly in excavation. Use minimum forming above ground.

3.3 STEEL PLACEMENT

A. Install poles plum (vertically straight).

B. For signal poles, tighten anchor bolt nuts to snug-tight plus 1/3 turn.

C. For poles with break-away slip base systems, tighten anchor bolt nuts as shown on SL series Standard UDOT Drawings.

D. Field assemble two-piece mast arm slip joint to achieve a snug fit. Apply anti-seize compound and provide overlap not less than 1.5 times inside diameter of end section.

3.4 TRENCHING AND DIRECTIONAL BORING FOR CONDUIT

A. Trenching Paved Surface (asphalt concrete):
   1. Do not use backhoe.
   2. Make the trench 6-inches wide or less.
   3. Use flowable fill to within 3-inches of the existing roadway surface.
   4. Evenly apply tack coat before final backfill.
   5. Match the composition, density, and elevation (±3/16-inch) of the existing surface in the final 3-inches of backfill.

B. Trenching Unpaved Surface:
   1. Use backfill that matches the composition, density, and elevation (±3/16-inch) of the existing surface.
   2. Install conduits that cross finished curbs and gutters, sidewalks, concrete flatwork, textured or decorative surfaces by jacking, drilling, or pushing. Entirely replace any damaged section at no additional cost to Department.
   3. Dispose of surplus material daily.

D. Trenching under Railroad:
   1. As specified in railroad agreement.

E. Minimum cover of conduit:
   1. Minimum cover for all roadway crossings: 24-inches for conduit placed in trench; and 36-inches for directional bore conduit.
   2. Minimum cover off roadway without concrete encasement or capping: 18-inches.
   3. Minimum cover off roadway with concrete encasement or capping with minimum thickness of 2-inches: 12-inches.

F. Directional Boring:
   1. Directional boring is an approved alternative to trenching unless otherwise specified.

3.5 INSTALL CONDUIT

A. Place all conduits in the same trench before surfacing.

B. Use galvanized rigid steel conduit above ground. Use PVC conduit under ground.

C. Seal uncapped conduit ends inside junction box with at least 2-inches of duct caulking or PVC cap.

D. Install No. 14 AWG single conductor copper, type THHN pull wire in all unused/future-use conduit.
   1. On each end of conduit install cap with 7/32-inch hole for pull wire.
   2. Leave 20-inches of wire outside of the cap, fastened securely.
   3. Place future-use conduit in top portion of junction boxes for future access.

E. Secure conduit on structures with standard galvanized iron conduit clamps using at least 5/16-inch diameter concrete expansion anchors at maximum 60-inch spacing.

F. Use conduit expansion fittings at structure expansion joint crossings.

3.6 INSTALL WIRING

A. Conductors:
   1. Clean and dry the inside of the conduit before installing conductors.
   2. Install grounding conductor in all power circuit conduits.
   3. Use powered soapstone, talc or other approved lubricants when pulling conductors in conduit.
   4. Tape the ends of unused conductors and label them as spares.
   5. Use conductors that are color coded as specified. See table 4. Meet IMSA 20-1.

B. Bonding Conductor (Ground) Wire:
   1. Size bonding wire in conformance to NEC article 250. Run continuously and bond to each metal signal pole.
   2. Bond the grounding system conductor to the ground rod in each junction box except in circuits with less than 50 V.

C. Arrange the wiring neatly within cabinets, junction boxes, fixtures, etc.

D. Terminate all terminal connections by a mechanical (spade) connector.

E. Loop Detection Wire Splicing:

1. Cable splices are only permitted in detection circuits where the wire type changes in the junction boxes. No other splices are allowed.
    a. Strip insulation back on the ends of the shielded cable wires and all of the loop wires that are to be joined in series to allow a non-insulated butt splice to be crimped onto them with a 1/8-inch of copper extending past the end of the butt splice.
    b. Strip loop ends as needed. Strip home run cable as needed and cut off the bare conductor drain wire. Use non-insulated butt splice connectors and crimp the loop leads to the home run leads then solder these connections.
    c. When all pairs have been joined in this manner use an electric or butane soldering iron to solder the splices ensuring that solder covers the splice inside and out. Do not melt the insulation.
    d. Wrap each soldered connection with black tape and mastic tape to insure the non-insulated butt splices will not short circuit. Wrap entire splice with mastic tape then wrap the entire splice area with black tape. Be sure to overlap the outer sheaths on the home run and the loop leads by 1-inch. Liberally apply waterproof sealant over the black tape and let dry.
    e. Use a nylon tie wrap to secure the loop leads at the best location possible inside the pull box. Provide loop leads that are at least 48-inches long as measured from the top of the pull box to allow the Contractor to work on the splice above the box.

F. Mark cabinet cables with colored vinyl electrical tape as specified in Table 3. Meet UL 510.

G. Connect conductors according to Table 4.

Table 3

Cables Marked with Colored Tape				
	Northbound P2	**Southbound P3**	**Eastbound P4**	**Westbound P1**
Signal Circuit	Blue	Red	Yellow	Orange
Detector Circuit	Blue	Red	Yellow	Orange
	Circuit Coding One band = Through, Two bands = Left Turn, Three bands = Queue, Four bands = Dilemma			
Pedestrian Head Circuit	Blue & Green	Red & Green	Yellow & Green	Orange & Green
Pedestrian Button Circuit (3)	Blue & White	Red & White	Yellow & White	Orange & White

Table 4

Color-Coded Conductors		
	North-South	**East-West**
Seven-Conductor Pedestrian Circuit	Red – Don't Walk Green -Walk White – Neutral	Black - Spare Orange – Don't Walk Blue - Walk White with Black Tracer - Neutral
Four -Conductor Pedestrian Head Circuit Push Button Circuit	Red – Pedestrian Call White - Common	Black - Pedestrian Call White - Common
Seven-Conductor Signal Circuit	White – Neutral Red - Red Through Orange - Yellow Through Green - Green Through Blue - Green Arrow White with Black Tracer - Yellow Left Black - Left red or spare	

3.7 INSTALL DETECTOR LOOPS

A. Refer to SL series Standard UDOT Drawings.

B. One turn is once around the perimeter of the loop with the same conductor.
   1. Use number of turns as specified in Table 1 (Loop Resistance Table).
   2. Do not allow twists in the loop.
   3. No splices are allowed in loop

C. Loop lead-in from loop to junction box:
   1. Minimum of 3 twists per foot in saw cut.
   2. Minimum of 6 twists per foot inside of conduit.
   3. Do not interweave with other loop lead-ins.
   4. Each lead-in requires a separate conduit.

D. For Detector Lead-in (feeder) from the junction box to controller cabinet, carry shield continuity across all splices.

E. Saw cut loop:
   1. Only circular loops may be saw cut into existing surfaces.
   2. Remove all loose material and wash and dry all saw cuts.
   3. Place all loop wire in a ¼-inch polyethylene tube.
   4. Seat the conductor with no damage at the bottom of the slot. Place 1-inch backer rod pieces 18-inches along saw slot to prevent loop wires from floating upward in sealant.
   5. Fill the saw cut with embedding sealant; surround the polyethylene tube to the level of the existing roadway surface. Remove any excess embedding sealant.

F. Preformed loop:
   2. Trench 6-inch maximum width with 6-inch minimum to 12-inch maximum cover, in order to place loops below the pavement section.
   2. Loops that are more than 8 inches below finished surface will have an additional turn in them to compensate for reduced sensitivity.
   3. Anchor sensor loops to prevent movement or floating.
   4. For loops trenched under existing asphalt, apply a tack coat to the sides and the bottom of trench and backfill with hot mix asphalt, ½ inch maximum aggregate mix. Refer to Sections 02741 and 02748. Compact with flat nose on a jack hammer in 3-inch maximum lifts.
   5. Loops under new pavement are to be preformed and placed 1 ¾ inches below the surface of the base course and backfill with surrounding material.

3.8 INSTALL POWER SOURCE

A. Verify the exact location, voltage, procedure, and materials required by the power company.

B. Refer to SL series Standard UDOT Drawings.

3.9 INSTALL LUMINAIRE

A. As specified.

B. Refer to SL series Standard UDOT Drawings.

3.10 INSTALL SIGNAL HEAD

A. Refer to SL series Standard UDOT Drawings.

B. Do not install signal heads at the intersection until ready for operation.

C. If turn on is not immediate, completely cover the vehicle signal heads with orange non-transparent, plastic garbage bags tied securely around the signal head. New signal heads must not block active existing signals prior to new signal turn on.

D. Install optically-programmed signal heads in accordance with the manufacturers' instructions.

E. Use louvered back plates on all signal heads except Type V.

F. Use cable straps for all universal signal mounts.

3.11 INSTALL MAST ARM SIGNS

A. Attach mast arm sign with mounting brackets using stainless steel straps. Do not drill holes in poles except as shown on the plans.

B. Mount sign on mast arm so that the legend/message is horizontal, even if on a curved section of mast arm.

3.12 REMOVE AND SALVAGE EXISTING EQUIPMENT

A. Light poles, signal poles, messenger cable, signal and pedestrian heads, controller cabinets, other items as specified on the plans remain the property of the Department.

B. Transport items to the specified location.

C. Remove foundations to a depth of at least 6 inches below the existing surface.

D. Backfill all holes with local material and compact to the density of the surrounding area.

3.13 INSTALL VIDEO DETECTION

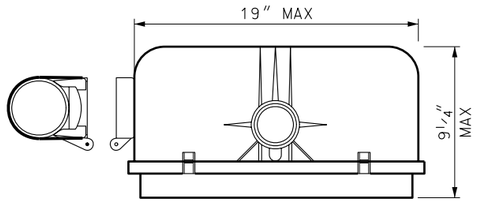
A. Install all video detection components in accordance with the manufacturer specifications.

B. Mount each video detection camera on the signal mast arm using the State-Furnished 46 inch extension pole and mounting bracket. Refer to SL series Standard UDOT Drawings for camera placement mount.

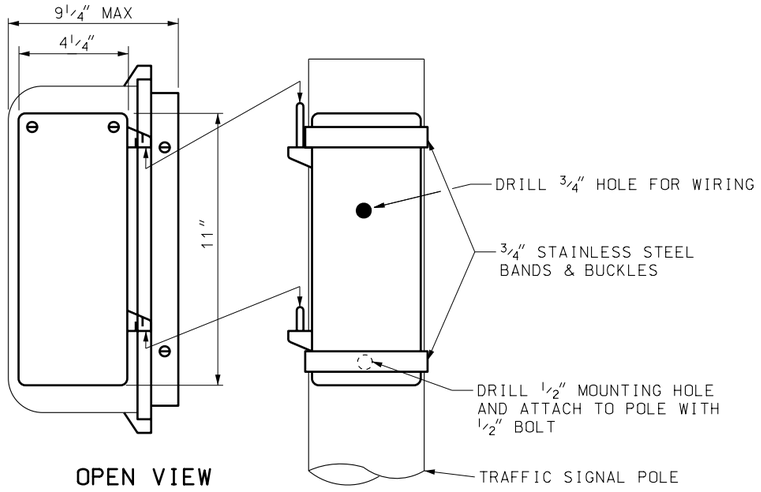
C. Video detection cameras are to be installed under the direction and supervision of UDOT staff, as specified. Provide a fully functional detection system.

END OF SECTION

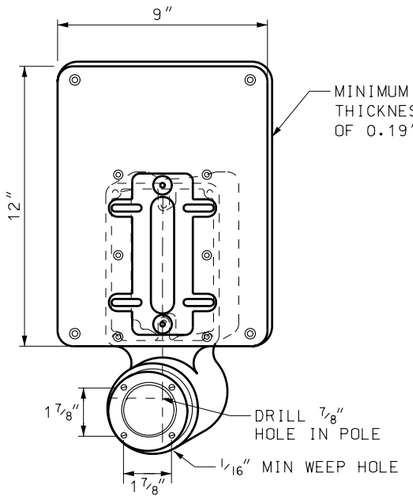
CLAMSHELL MOUNTING HARDWARE



TOP VIEW

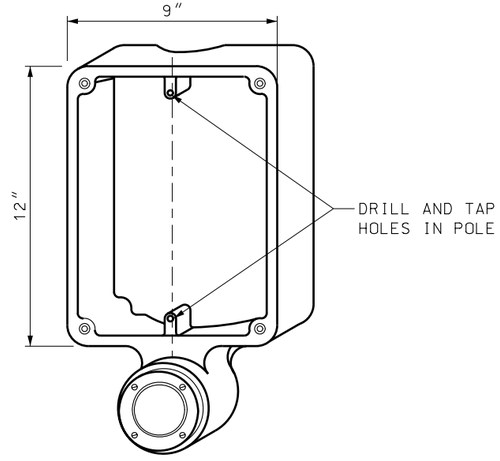


OPEN VIEW



OPTION 1

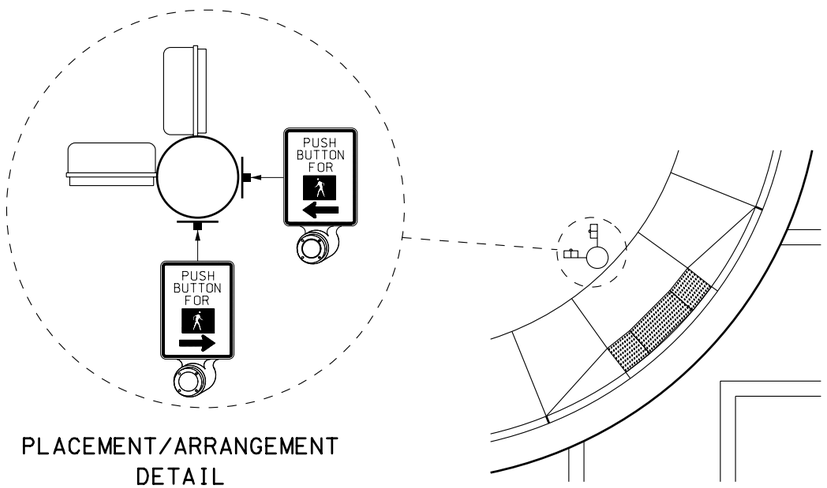
FRAME TO ACCOMMODATE
5" x 7" SIGN WITH ADAPTOR
PLATE FOR 9" x 12" SIGN



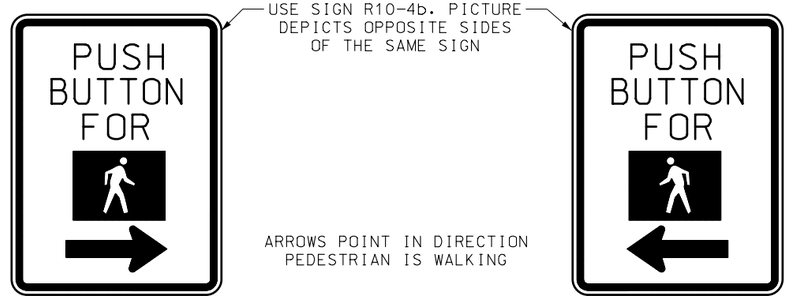
OPTION 2

FRAME TO ACCOMMODATE
9" x 12" SIGN

TYPICAL MOUNTING OF PEDESTRIAN SIGNAL AND PUSH BUTTON ON A SIGNAL POLE



PLACEMENT/ARRANGEMENT DETAIL



NOTES:

1. MOUNT PEDESTRIAN SIGNALS 9'-3" ± 6" FROM CONCRETE LANDING TO BOTTOM OF HOUSING.
2. MOUNT PUSH BUTTONS 42" ± 2" ABOVE CONCRETE LANDING. SEE STD DWG GW 5A, 5B, AND 5C FOR LANDING DETAILS.
3. PLACE PUSH BUTTON AND PEDESTRIAN SIGNAL WITHIN TEN FEET OF THE FRONT OF DETECTABLE WARNING SURFACE, MEASURED FROM THE CENTER OF THE CURB CUT.
4. WHEN USING PEDESTRIAN POLES FOR PUSH BUTTONS AND PEDESTRIAN SIGNALS, USE ONE POLE FOR EACH DIRECTION OF TRAVEL. TWO 9" x 12" SIGN FRAMES WILL NOT FIT ON ONE PEDESTRIAN POLE.

REVISIONS

NO.	DATE	APPR.	REMARKS
1	12/18/03	LM	ENTIRE DRAWING MODIFIED.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL _____ DATE _____
DEPUTY DIRECTOR

CHAIRMAN STANDARDS COMMITTEE APPROVED _____ DATE _____

PEDESTRIAN SIGNAL ASSEMBLY

STANDARD DRAWING TITLE

STD DWG
SL 9

Standards Committee Submittal Sheet

Name of preparer: Glenn Schulte
Title/Position of preparer: Transportation Safety Specialist/Inspector II
Specification/Drawing/Item Title: Pre-cast Constant Slope Concrete Barrier
Specification/Drawing Number: BA 3A, BA 3B

Enter appropriate priority level:
(See last page for explanation) **3**

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web. (http://www.udot.utah.gov/index.php/m=c/tid=303)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

BA 3A: Because this drawing has so much information on it was suggested it be split into two drawings, BA 3A1 and BA 3A2.

BA 3A1, Sub-base requirement was added as per constructions request

BA 3A1, Note added to Trailing End Option 2: Install X connection
This note was added in anticipation of approval of the pre-cast constant slope barrier.

BA 3A2, this drawing was created directly from STD DWG BA 3A. Notes were placed as per application to each of the drawings.

BA 3B, Added note 10 and identifier on Elevation Detail near Section D-D indentifier.

Changes to include the X Connection on above described drawing are in anticipation of approval of the X Connection Pre-cast Constant Slope Barrier, BA 3C

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No bid item required

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at http://www.udot.utah.gov/index.php/m=c/tid=659 for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

No comments as of 11-6-2006

ACEC Comments: (Use as much space as necessary.)

No comments as of 11-6-2006

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Structures: Boyd Wheeler & Degan Lewis reviewed & commented. Correction made as per their recommendations.

Construction Engineers:
No comments as of 11-6-2006

Contractors (Any additional contacts beyond “C” above.)
No comments as of 11-6-2006

Suppliers

No comments as of 11-6-2006

Consultants (as required) (Any additional contacts beyond “C” above.)

No comments as of 11-6-2006

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

No comments as of 11-6-2006

Others (as appropriate)

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

The connecting X-bolts cost approximately $100 per stick extra.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

BA 3A Split: makes the drawing more readable with less likely hood of requirements being missed.

BA 3A1: Sub-Base Requirements, clarifies requirements Construction is already using. X Connection note gives guidance on which type of connection is required per and individual application.

BA 3B:This will require the design/contractor to be aware of the type of system needing to be constructed in order to provide the right connection.

3. Life cycle cost.

No Changes

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Will provide a positive connection for all systems.

H. Safety Impacts?

NONE

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Priority Explanation

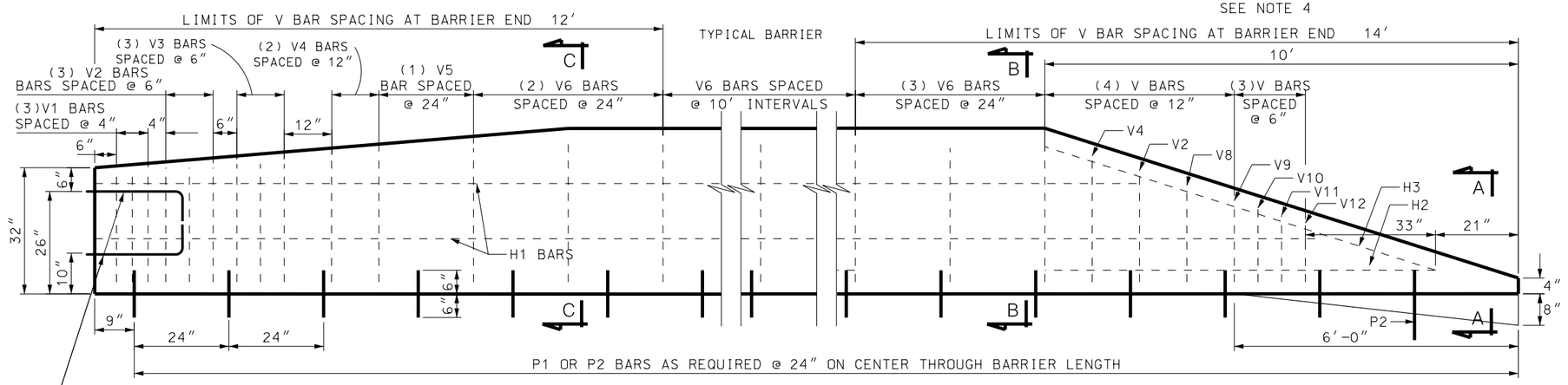
Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

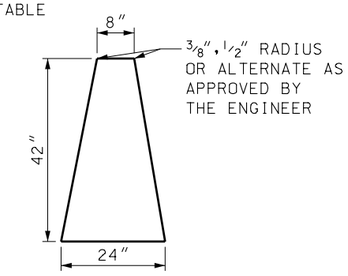
APPROACH END (A)
SEE NOTE 4



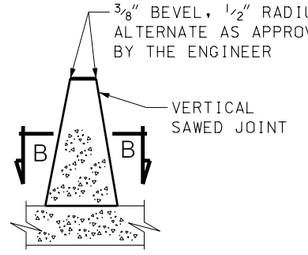
INSTALL CONNECTION LOOPS PER STD DWG BA 1A CONNECTION DETAILS. USE CONNECTION PIN AS PER STD DWG BA 1B

SLOPED TRAILING END (B) OPTION 1
SEE NOTE 4

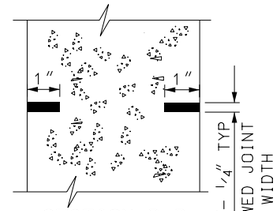
ELEVATION
SEE STD DWG BA 3A2 FOR CROSS SECTIONS AND REINFORCING STEEL TABLE



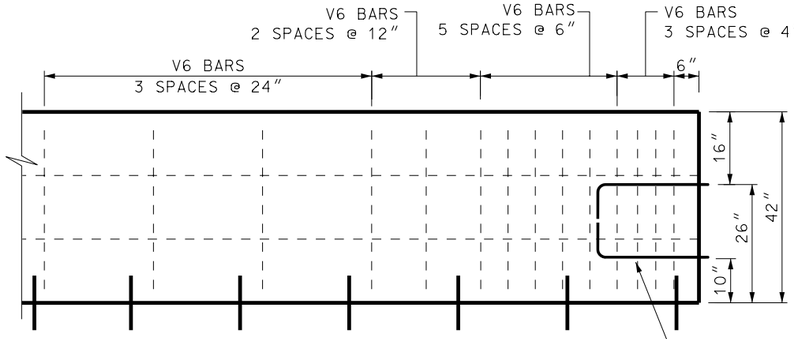
TYPICAL SECTION



SECTION THROUGH SAWED JOINT
SEE NOTE 5

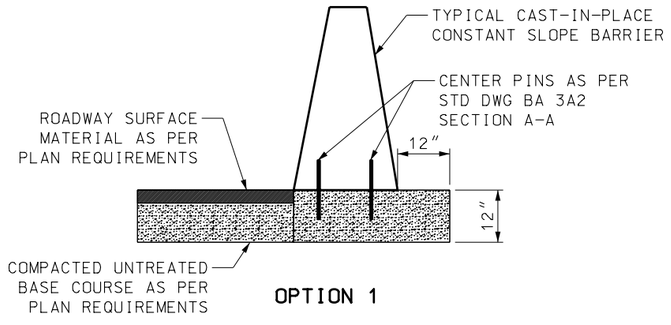


SECTION B-B
SEE NOTE 5

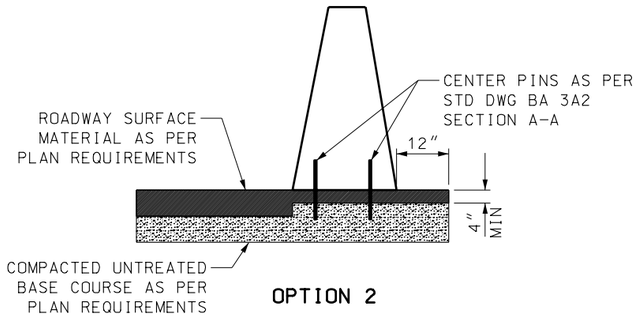


TRAILING END (C) OPTION 2
SEE NOTES 4 & 6

INSTALL X CONNECTION AS PER STD DWG BA 3C WHEN TRANSITIONING TO PRECAST CONSTANT SLOPE BARRIER



OPTION 1



OPTION 2

SUB-BASE REQUIREMENTS

NOTES:
1. THE ENGINEER APPROVES CONTRACTOR DEVISED METHOD OF POSITIONING THE LONGITUDINAL REINFORCING STEEL +/- 1/2" AS DIMENSIONED.
2. DO NOT USE TO SUPPORT HIGHWAY LIGHTING POLES. ADDITIONAL SUPPORT DETAILS REQUIRED.
3. DO NOT USE BARRIER FOR BRIDGE APPLICATIONS.
4. CHOOSE APPROPRIATE END TREATMENT:
   A. CONSTRUCT APPROACH END AS PER DETAIL APPROACH END (A) WHEN CRASH CUSHION INSTALLATION IS REQUIRED.
   B. CONSTRUCT TRAILING END AS PER DETAIL APPROACH END (A) WHEN CRASH CUSHION INSTALLATION IS REQUIRED.
   C. CONSTRUCT SLOPED TRAILING END (B) WHEN BARRIER END DOES NOT REQUIRE A CRASH CUSHION, IS OUTSIDE THE MINIMUM REQUIRED CLEAR ZONE, BUT IS WITHIN 1.2 TIMES THE MINIMUM REQUIRED CLEAR ZONE OF APPROACH TRAFFIC.
   D. USE OF SLOPED END PERMITTED FOR APPROACH TRAFFIC WHEN DESIGN SPEED IS 40 MPH OR LESS.
   E. FULL HEIGHT BARRIER, TRAILING END OPTION (C), IS ACCEPTABLE WHEN THE END IS GREATER THAN 1.2 TIMES MINIMUM REQUIRED CLEAR ZONE OF APPROACH TRAFFIC.
5. SAW CONTRACTION JOINTS AT PAVEMENT TRANSVERSE JOINTS. WHEN INSTALLED WITH ASPHALT PAVEMENT SAW CONTRACTION JOINTS AT 15 FOOT INTERVALS. ADJUST REBAR AT JOINT TO MAINTAIN MINIMUM 2 INCH OFFSET BETWEEN REBAR AND JOINT.
6. V6 BARS PER TRAILING END OPTION 2 AT BOTH SIDES OF CONSTRUCTION JOINT.
7. USE COATED REINFORCEMENT STEEL EXCEPT AS NOTED.
8. USE CLASS AA(AE) CONCRETE.

REVISIONS

NO.	DATE	APPR.	REMARKS
1	02/24/05	G.S.	REPLACED BA 3.
2	10/29/06	G.S.	SPLIT INTO 2 DRAWINGS, ADDED SUBBASE REQUIREMENTS, X CONNECTION NOTE OPTION C.

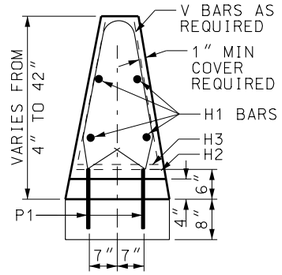
UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL — FEB.24.2005 DATE
CHAIRMAN STANDARDS COMMITTEE
APPROVED — FEB.24.2005 DATE
DEPUTY DIRECTOR

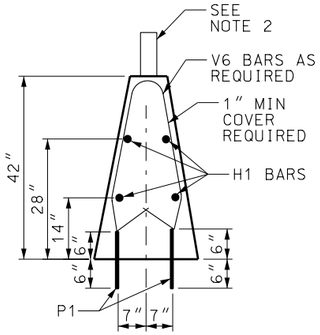
CAST IN PLACE CONSTANT SLOPE BARRIER

STANDARD DRAWING TITLE

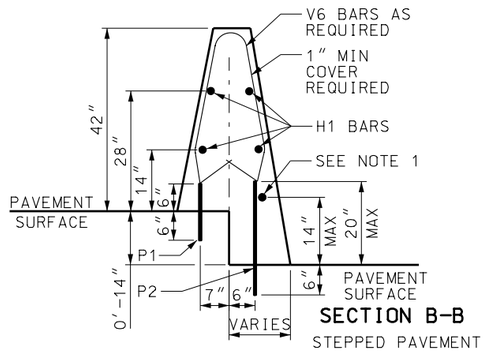
STD DWG
BA 3A1



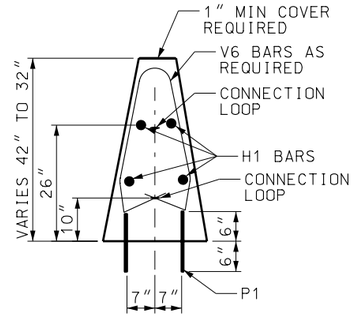
SECTION A-A



SECTION B-B



SECTION B-B
STEPPED PAVEMENT



SECTION C-C

REINFORCING STEEL TABLE

MARK	BAR SIZE	(NO.) OF BARS				SKETCH
H1	#5	4 OR 5 RUN THROUGH LENGTH OF BARRIER REQUIRED SPLICE LENGTH - 45"				
H2	#5	TRAILING END SECTION (B) BOTTOM SIDE				8'-3" 1'-7"
H3	#5	TRAILING END SECTION (B) TOP SIDE				8'-3" 6" 1'-7"
END OPTION		(A)	(B)	(C)	D	
V1	#5	3			28"	
V2	#5	3	1		29"	
V3	#5	3			30"	
V4	#5	2	1		32"	
V5	#5	1			34"	
* V6	#5	2	3	14	36"	
V7	#5		1		25"	
V8	#5		1		22"	
V9	#5		1		20"	
V10	#5		1		18"	
V11	#5		1		16"	
P1	#8	BARRIER TO PAVEMENT				12" LONG PINS @ 24" CENTERS
P2	#8	BARRIER TO PAVEMENT STEPPED PAVEMENT				26" LONG PINS @ 24" CENTERS

2 1/4"R
D
7"
15"
9 1/4"

* V6 BARS SHOWN IN CHART ARE THE NUMBER OF BARS REQUIRED FOR EACH END OPTION.
SPACE V6 BARS AT 10' INTERVALS THROUGH TYPICAL BARRIER SECTION.

NOTE:

1. ATTACH ADDITIONAL H1 BAR TO P2 BAR WHEN STEPPED PAVEMENT CONFIGURATION REQUIRED.
2. SEE STD DWG GW 9 FOR DELINEATION HARDWARE AND STD DWG GW 10 FOR DELINEATION SPACING.

REVISIONS

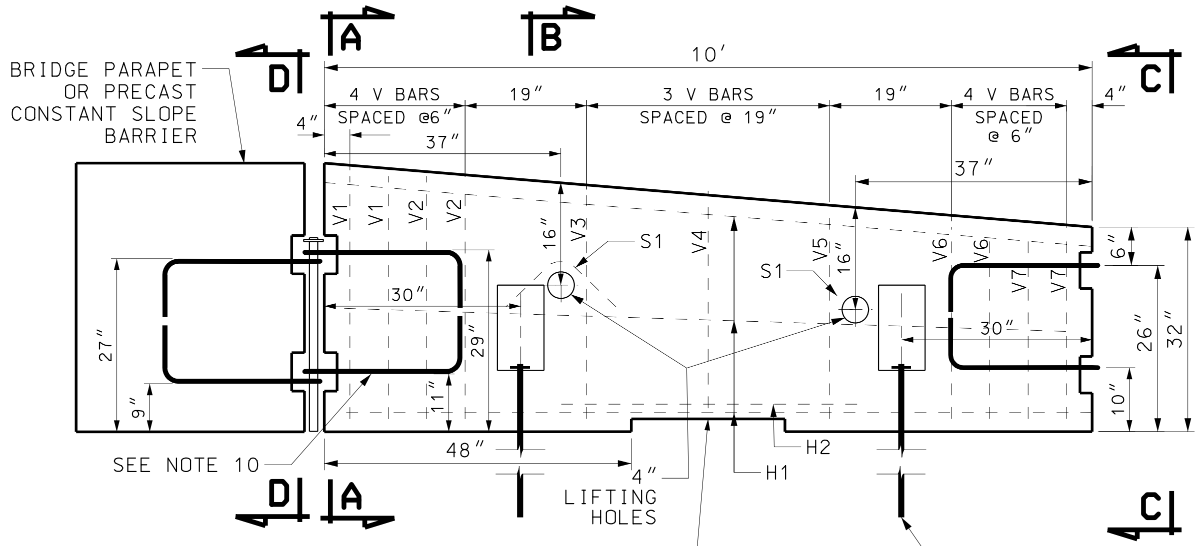
NO.	DATE	APPR.	REMARKS
1	02/24/05	G.S.	REPLACED BA 3.
2	10/29/06	G.S.	SPLIT DETAILS FROM BA 3A.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

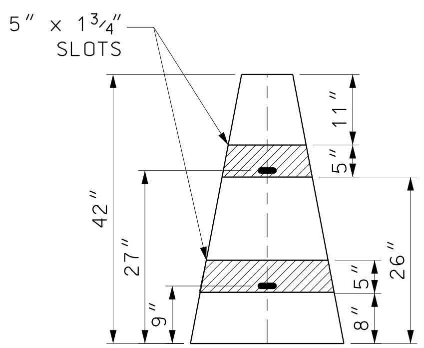
RECOMMENDED FOR APPROVAL — FEB.24.2005 DATE
CHAIRMAN STANDARDS COMMITTEE — DATE
APPROVED — FEB.24.2005 DATE
DEPUTY DIRECTOR

CAST IN PLACE CONSTANT SLOPE BARRIER
STANDARD DRAWING TITLE

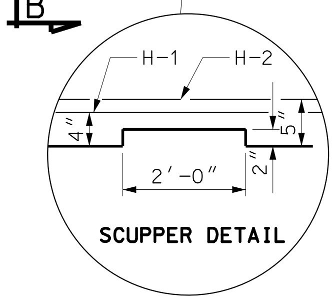
STD DWG
BA 3A2



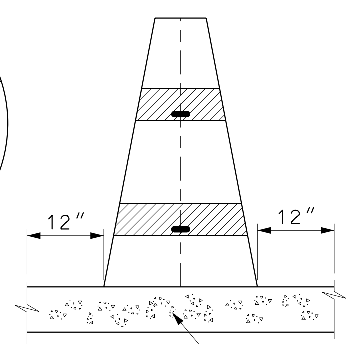
ELEVATION

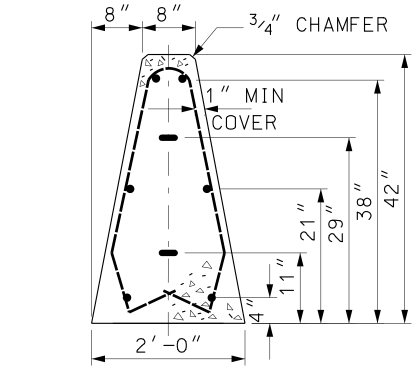


SECTION D-D

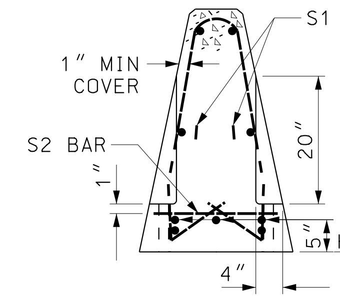


SCUPPER DETAIL

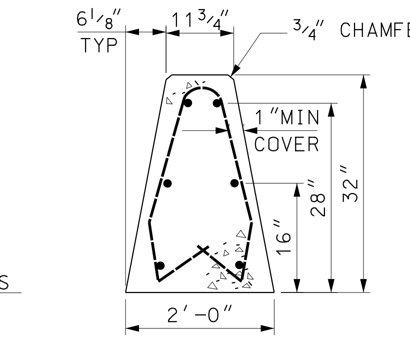




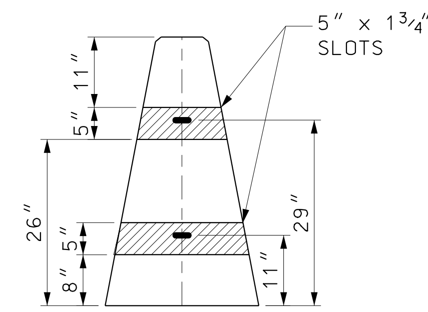
SECTION A-A



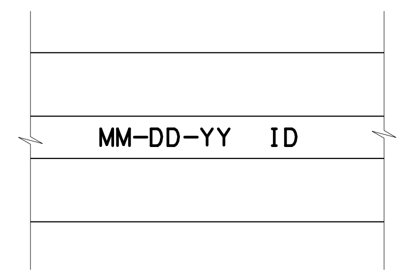
SECTION B-B



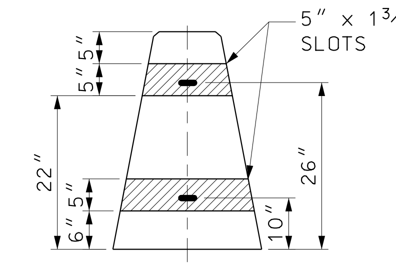
SECTION C-C



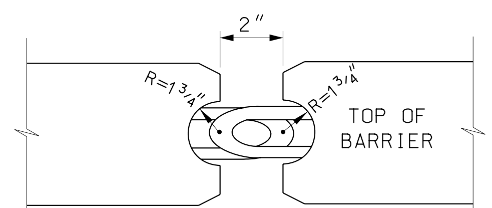
SLOT DETAIL
SECTION A-A



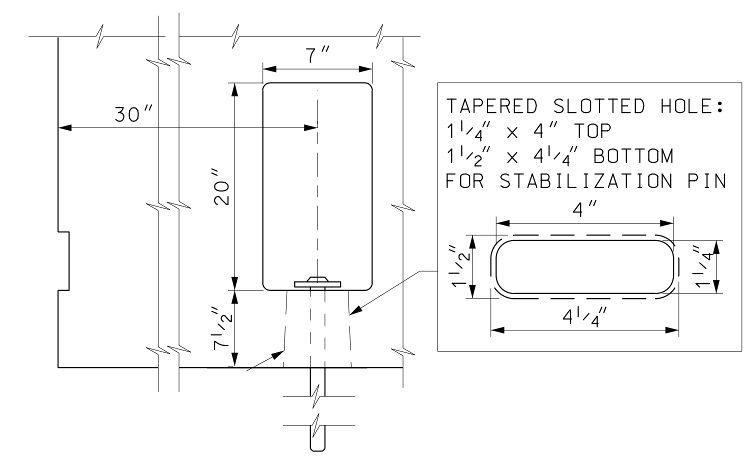
BARRIER MARKINGS
SEE NOTE 6



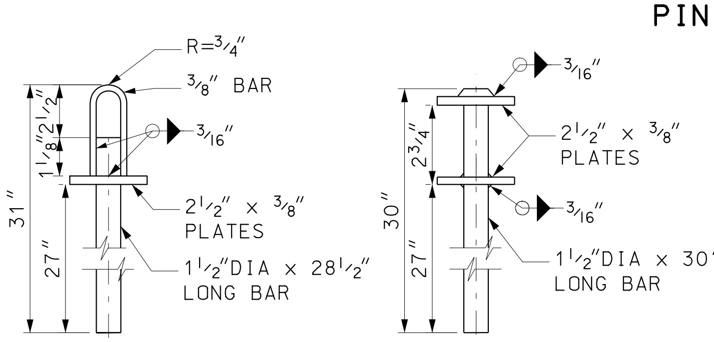
SLOT DETAIL
SECTION C-C



PIN ACCESS DETAIL

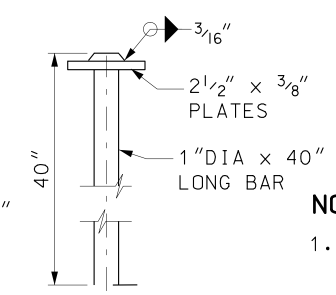


BARRIER STABILIZATION
SLOT DETAIL

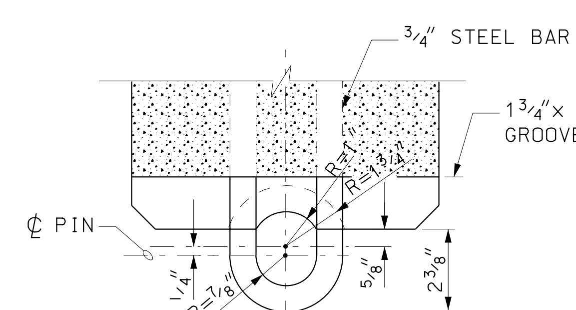


OPTION 1 OPTION 2

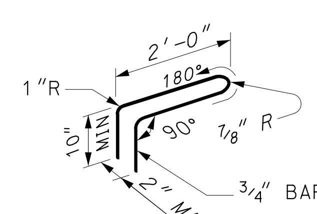
GALVANIZED
CONNECTION PIN
SEE NOTE 9



GALVANIZED
STABILIZATION PIN
SEE NOTE 9



LOOP DETAIL



GALVANIZED
STEEL BAR

CONNECTION DETAILS

STEEL REINFORCEMENT TABLE

MARK	BAR SIZE	NO. OF BARS		SKETCH	
H1	#5	(6) RUN THROUGH LENGTH OF BARRIER		9′-1″	
H2	#5	(3) BARS CENTERED OVER SCUPPER		4′-4″	
S1	#4	(2) 2 BARS CENTERED OVER EACH LIFTING HOLE		3 3/8″R, 2′-5″, 1″ COVER, 90°	
S2	#4	(2) BARS CENTERED 1″ BELOW TOP OF STABILIZATION PIN SLOTS		1 1/2″R, SLOTS, 7″, 1′-6″, 1″MIN CLEAR TO BAR	
		#		D	
V1	#5	2	(11) BARS PLACED AS PER ELEVATION DETAIL	38″	2 1/4″R, D, 7″, 15″, 9 1/4″
V2	#5	2		37″	
V3	#5	1		35″	
V4	#5	1		34″	
V5	#5	1		33″	
V6	#5	2		30″	
V7	#5	2		29″	

NOTES:

1. TRANSITION SECTION REQUIRED WHEN A CRASH CUSHION OR W-BEAM GUARDRAIL TRANSITION IS REQUIRED ON A CONSTANT SLOPE BRIDGE PARAPET.
2. PROVIDE 4″ OF PAVEMENT OR NON-PERMEABLE MATERIAL 1′IN FRONT OF AND 1′ ON BOTH SIDES OF TRANSITION SECTION. PLACE TRANSITION SECTION ON TOP OF FINAL PAVEMENT COURSE.
3. ALL APPLICATIONS REQUIRE THE INSTALLATION OF STABILIZATION PINS AND CONNECTION PINS. PRE DRILL 1″ HOLE THROUGH PAVEMENT SURFACE PRIOR TO INSTALLING STABILIZATION PINS.
4. USE A 4″ WHITE PVC SLEEVE TO FORM THE LIFTING HOLES. LEAVE SLEEVE IN PLACE AFTER CASTING.
5. PLACE AN ADEQUATE AMOUNT OF SILICONE ADHESIVE ON BOTTOM OF WASHER BEFORE INSERTING PIN TO HOLD IN PLACE AND PREVENT EASY HAND REMOVAL.
6. MARK EACH TRANSITION SECTION WITH 1 1/2″ NUMBERS INDICATING THE DATE OF CASTING AND IDENTIFICATION NUMBER SUPPLIED BY THE INSPECTOR, IMPRESSED 1/4″ DEEP INTO THE TOP CENTER OF THE BARRIER.
7. USE COATED REINFORCEMENT STEEL.
8. USE CLASS AA(AE) CONCRETE.
9. USE OF A HOT FORGED HEAD, MEETING PLATE SIZE AND THICKNESS IS ACCEPTABLE IN PLACE OF A WELDED PLATE.
10. INSTALL TYPE X JOINT CONNECTION AS PER STD DWG BA 3C WHEN ATTACHING TRANSITION SECTION TO PRE-CAST CONSTANT SLOPE BARRIER.

REVISIONS

NO.	DATE	APPR.	REMARKS
1	02/24/05	G.S.	NEW DRAWING.
2	08-25-05	G.S.	ADDED NOTE 9. CORRECTED CONNECTION PIN OPTION 1 DIMENSIONS. CHANGED WELDING INFORMATION ON PIN DETAIL.
3	10/29/06	G.S.	ADDED NOTE 10.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL AUG.25,2005 DATE
CHAIRMAN STANDARDS COMMITTEE APPROVED AUG.25,2005 DATE
DEPUTY DIRECTOR

PRECAST CONCRETE CONSTANT SLOPE TRANSITION SECTION FOR CRASH CUSHION AND W-BEAM GUARDRAIL

STANDARD DRAWING TITLE

STD DWG
BA 3B

DGN File: L:\Standard_Drawings\Imperial\2005Working\StandardsCommitteeFiles\November06\BA03B.dgn
09-NOV-2006

Standards Committee Submittal Sheet

Name of preparer: Glenn Schulte/Mike Donivan
Title/Position of preparer: Safety Specialist
Specification/Drawing/Item Title:
Specification/Drawing Number: BA-4B, BA-4D, BA-4E, BA 4L, BA-4P, New Drawings BA-4Q1 AND BA-4Q2

Enter appropriate priority level:
(See last page for explanation) **3**

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web. (http://www.udot.utah.gov/index.php/m=c/tid=303)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.
   1. **BA 4B**
      a. REMOVE ONE BLOCKOUT FROM POST 3, 4 AND 5.
         (1) Field review has shown third block not needed.
      b. POST 5 AND 6 GUARDRAIL NOT ATTACHED TO POST NOT NEEDED.
         (1) Additional holes in the w-beam panel would be required which are not necessary.

   2. **BA 4D**
      a. ADDED DELINEATION SHEETING AND MARKER POST FOR BIDIRECTION TRAFFIC DETAIL.
         (1) These details were added upon suggestion from Maintenance. Maintenance felt it would be beneficial to the motorist and to them during bad weather conditions.

   3. **BA 4E**
      a. Install. W/Curb & Gutter: REPLACED NOTE WITH SEE BA 4Q.
         (1) New drawings developed for the installation on W-beam with curb & gutter.
      b. Install. W/Asphalt Curb: ADDED 2 INCH DETAIL TO OPTION 2:
         (1) This will insure a higher curb is not placed and become a vaulting issue for an impacting vehicle.

c. Barrier on 6:1 Slope Detail: ADDED NOTES 1,2 AND 3. ADDED ≥12 AND NO BARRIER PLACEMENT, ADDED ONE MORE POST TO DETAIL.
   (1) Added for better understanding for our installers, inspectors, designers when installing w-beam barrier on a slope.
d. ADDED TRAFFIC ARROW TO SPLICE DETAIL.
   (1) Technical correction

4. **BA 4L**
   a. DUE TO CONFUSION, BY INSTALLERS, SUPPLIERS, AND INSPECTORS, OF THE BEGINNING AND ENDING POINTS OF RADIUS RAIL REQUIREMENTS, ANCHOR LOCATIONS AND REQUIREMENTS WHEN ATTACHING TO W-BAEM TRANSTITIOS THE FOLLOWIG CHANGES WERE MADE:
      (1) Revised radius detail to indicate starting and ending points.
      (2) Clarified anchor placement
      (3) Added note 6

5. **BA 4P**
   a. ADDED 45' AND 60' PRECAST to details
      (1) These are the required amounts of barrier required to cover box culverts with the available systems.
   b. ADDED NOTE 1.
      (1) Several locations were installed where bi-direction traffic was present and the installations were inside the clear zone. When inside the CZ a transition is installed to provide an impacting vehicle the protection of pocketing into the barrier end.

6. **BA 4Q1 AND BA 4Q2**
   a. NEW DRAWINGS FOR GUARDRAIL INSTALLATIONS WITH CURB AND GUTTER.
      (1) These standards will ensure w-beam barrier is designed and installed to afford the best protection for an impacting vehicle, by lessening the vaulting action or strengthening the barrier to allow the barrier to stay at the proper height for redirection.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.
   1. **BA 4B,** no change, price may be reduced because 3 blocks are being eliminated.
   2. **BA 4D,** should add verbiage indicating part of anchor system requirement.
      a. Should not be a separate pay item.
      b. Additional cost approximately $18.00. That is what we are currently paying for the marking on end treatments.
   3. **BA 4E**, no changes technical corrections and additions
   4. **BA 4L**, no change technical correction
   5. **BA 4P**, no pay item issues
      a. Cost for barrier may be increased when constant slope barrier is used because of the length of each section. (15')

6. **BA 4Q1 & BA 4Q2:** no pay item issues, all materials are covered in the M & P with current w-beam materials.

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at http://www.udot.utah.gov/index.php/m=c/tid=659 for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

No comments as of 11-6-2006

ACEC Comments: (Use as much space as necessary.)

No comments as of 11-6-2006

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers
Region 4: Clark MacKay reviewed and made comments on 6 drawings. Corrections and concerns addressed.

Contractors (Any additional contacts beyond "C" above.)
No comments as of 11-6-2006

Design Engineer
Region 4: Jared Dastrup, comments on BA 4Q2 addressed

Suppliers
No comments as of 11-6-2006

Consultants (as required) (Any additional contacts beyond "C" above.)
No comments as of 11-6-2006

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

No comments as of 11-6-2006
Others (as appropriate)

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

   No requirements

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

   No requirements

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)
   a. The changes addressed in the to the submitted documents are being used on a daily basis by UDOT & consultant designers, construction and installers. These changes will be addressed in any of the course taught. Division of Traffic & Safety sends out information concerning change requirements concerning barrier issues.

F. Costs? (Estimates are acceptable.)
1. Additional costs to average bid item price.
   a. **BA 4B,** price may be reduced because 3 blocks are being eliminated.
      (1) Contract price for blocks $7.00 (3 x 7.00= 21.00)
   b. **BA 4D,** Additional cost approximately $18.00, what contractors are currently paying for the marking on end treatments.
   c. **BA 4L**, no change technical corrections
   d. **BA 4P**, no pay item issues
      (1) Cost for barrier may be increased when constant slope barrier is used because of the length of each section. (15')

e. **BA 4Q1 & BA 4Q2,** may reduce these kinds of installation because many time they are installed, and changes are required to make them functional. These changes usually require a change order.
   (1) Verbiage should be added to M & P item 028410066 to include the backside rail element option in this pay item.

G. Operational Costs? (Estimates are acceptable.)
1. **BA 4B,** cost may be reduced for repairs because 1 or more blocks may not have to be reinstalled.
2. **BA 4D,** replacement may be required when damaged, $18.00
3. **BA 4E,** no change
4. **BA 4L**, no change
5. **BA 4P**, cost may increase with the use of Constant Slope Barrier.
6. **BA 4Q1 & BA 4Q2,** no change

H. Life cycle cost? (Estimates are acceptable.)
1. **BA 4B,** no change,
2. **BA 4D,** replacement may be required when damaged, $18.00
   a. Anecdotal history from conversations I've had with maintenance personnel who have stated they have come close to hitting or have hit the anchor systems when doing heavy plowing in some areas. I have no estimate of how many have been hit.
3. **BA 4E**, no change
4. **BA 4L**, no change
5. **BA 4P**, cost may increase with the use of Constant Slope Barrier.
6. **BA 4Q1 & BA 4Q2**, no change.

I. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)
1. **BA 4B,** cost reduction may be realized with 3 less blocks (3 x 7.00=$ 21.00)
2. **BA 4D,** replacement of anchor system may be avoided if an impact can be avoided with this type of delineation. No information on impacts needing repair. If a full system is required the cost for replacement is approximately $ 820.00, pricing derived from the Average Pricing list
3. **BA 4E**, clarifications will provide clear guidance for the installation of this barrier type.
4. **BA 4L**, clarifications will provide clear guidance for the installation of this barrier type.
5. **BA 4P**, cost may increase with the use of Constant Slope Barrier.
6. **BA 4Q1 & BA 4Q2**, clarifications will provide clear guidance for the installation of barrier when used in conjunction with curb and/or curb and gutter.

J. Safety Impacts?
1. **BA 4B,** no safety impact, system with 2 or 3 blocks meet required testing procedures.
2. **BA 4D,** installation of this delineation may help our maintenance personnel and the driving public to avoid these systems. This may also help a driver notice they are approaching a barrier.
3. **BA 4E,** gives better guidance in areas addressed therefore a better and safer roadside system.

4. **BA 4L**, gives better guidance allowing for proper installation of the system.better and safer roadside system.
5. **BA 4P**, no change
6. **BA 4Q1 & BA 4Q2,** these requirements will provide a better system for redirection when struck by an impacting vehicle.

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

1. **BA 4B,** this system was adopted and a mistake was made concerning the number of blocks required to get the curb section positioned properly under the rail element.
2. **BA 4D,** anecdotal history indicates this may benefit maintenance while clearing roadway in adverse weather conditions.
3. **BA 4E,** will provide better guidance
4. **BA 4L**, changes should alleviate installer misinterpretation of the drawing, and the system should be installed correctly the first time.
5. **BA 4P**, the additional note will ensure the transition is installed when required. To date no systems have been install incorrectly because an RE or Inspector have questioned the installations and requested clarification from the Division of Traffic & Safety.
6. **BA 4Q1 & BA 4Q2,** On several occasions installers and construction have called concerning the proper installation of w-beam with curb and gutter. Instructors of the RDG and Guardrail Installation Course instruct that w-beam guardrail may not work unless stiffened when it is associated with curbing because of the vaulting, which can occur from an impacting vehicle. These two drawing give the guidance need to stiffen the guardrail for better performance when impacted.

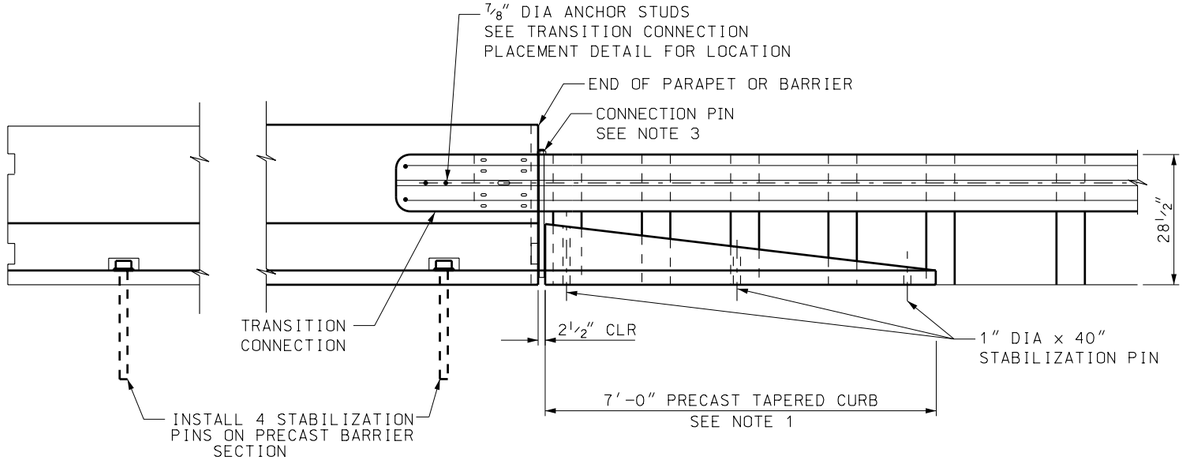
Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

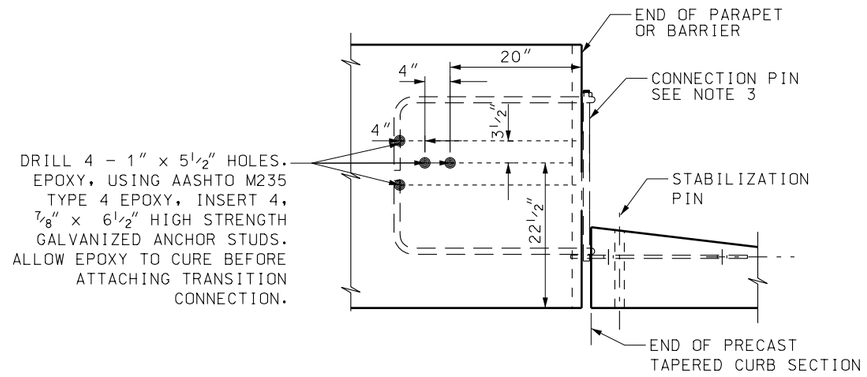
Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

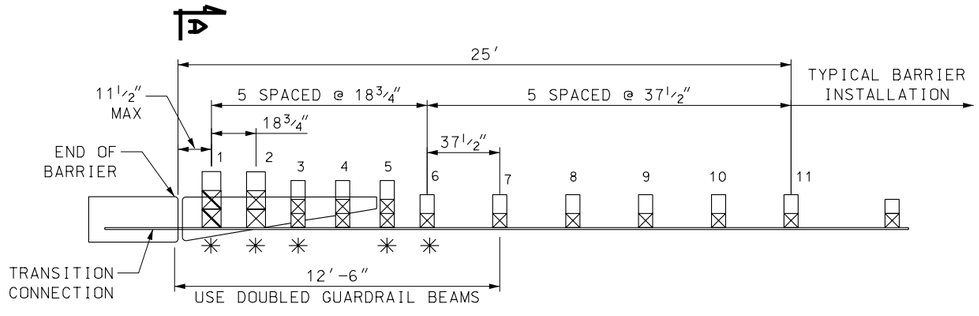


ELEVATION

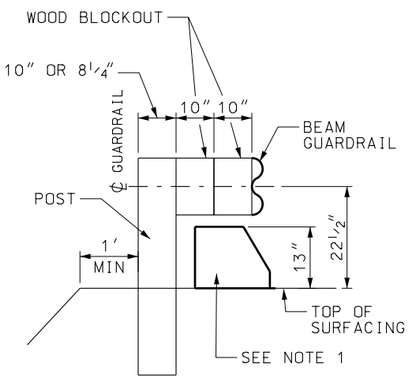
RIGHT SIDE SHOWN LEFT SIDE SIMILAR



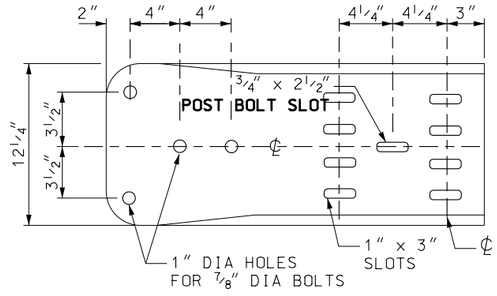
TRANSITION CONNECTION AND CURB SECTION PLACEMENT DETAIL



POST PLACEMENT DETAIL



SECTION A-A



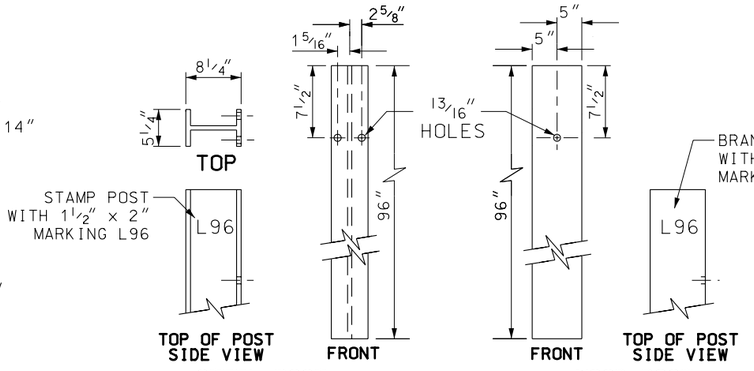
TRANSITION CONNECTION

WOOD POST OPTION
POST # 1 & # 2
- POSTS 10" x 10" x 8'
- BLOCKS 10" x 10" x 14"

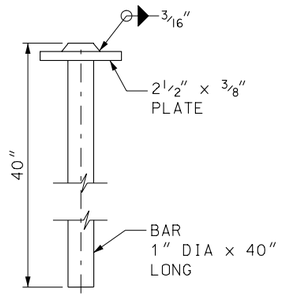
POSTS # 3 THROUGH # 11
- TYPICAL WOOD POSTS AND BLOCKS (SEE STD DWG BA 4A)

STEEL POST OPTION
POSTS # 1 & # 2
- W8 x 21 x 8'
- BLOCKS 6" x 8" x 14"

POSTS # 3 THROUGH # 11
- TYPICAL STEEL POSTS AND BLOCKS (SEE STD DWG BA 4A)



POSTS # 1 AND # 2 OPTIONS



STABILIZATION PIN

SEE NOTE 5

NOTES:

1. SEE PLAN SET FOR BARRIER OR PARAPET TYPE TO DETERMINE APPROPRIATE CURB SECTION. SEE STD DWG BA 4C FOR CURB SECTION REQUIREMENTS.
2. COMPLETE SITE PREPARATION PRIOR TO INSTALLING TRANSITION.
3. INSTALL A CONNECTION PIN USING A CONNECTION PIN FROM STD DWG BA 1B.
4. PRE-DRILL 1" HOLE THROUGH PAVED SURFACE PRIOR TO INSTALLING STABILIZATION PINS.
5. USE OF A HOT FORGED HEAD, MEETING PLATE SIZE AND THICKNESS IS ACCEPTABLE IN PLACE OF A WELDED PLATE.

REVISIONS

NO.	DATE	APPR.	REMARKS
1	02/24/05	G.S.	TITLE CHANGED. DRAWING COMPLETELY REVISED.
2	08/25/05	G.S.	ADDED NOTE 5. CHANGED WELDING INFORMATION ON PIN DETAIL.
3	10/29/06	G.S.	REVISED BLOCK REQUIREMENT.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

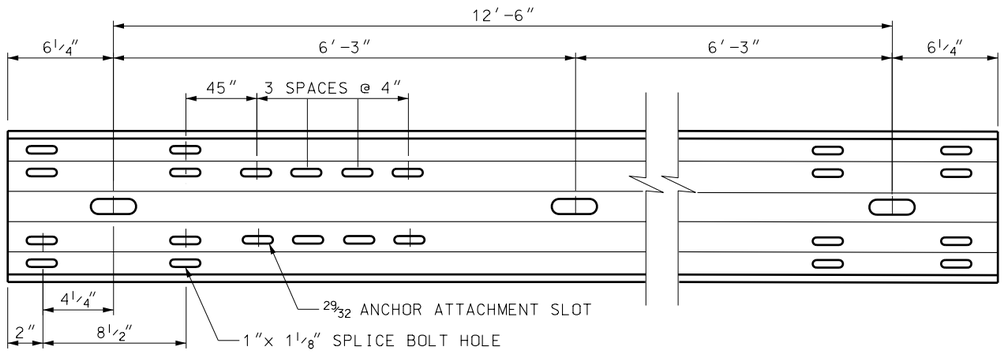
RECOMMENDED FOR APPROVAL — DEPUTY DIRECTOR — AUG.25,2005 DATE
CHAIRMAN STANDARDS COMMITTEE APPROVED — AUG.25,2005 DATE

W-BEAM GUARDRAIL TRANSITION

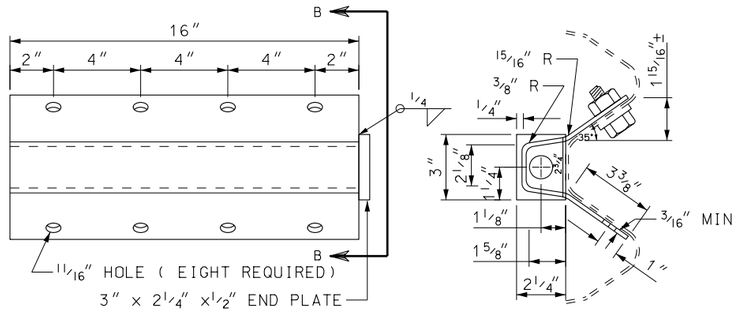
STANDARD DRAWING TITLE

STD DWG
BA 4B

DGN File:L:\Standard_Drawings\Imperial\2005\orking\Standard Files\November-06\BA04B.dgn
04-NOV-2006



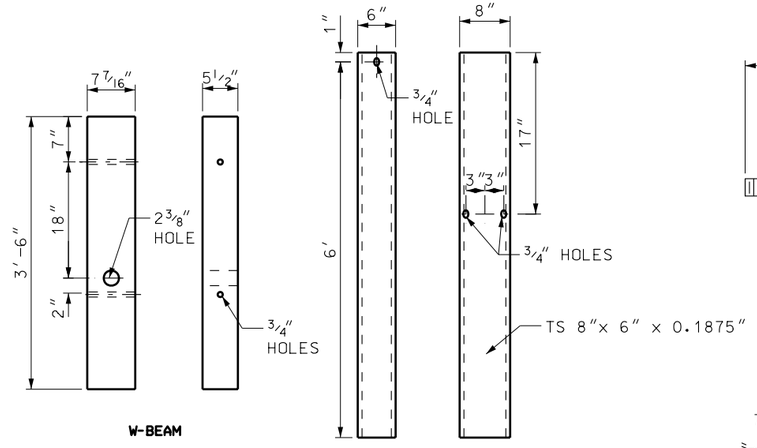
RAIL ELEMENT



ELEVATION

SECTION B-B

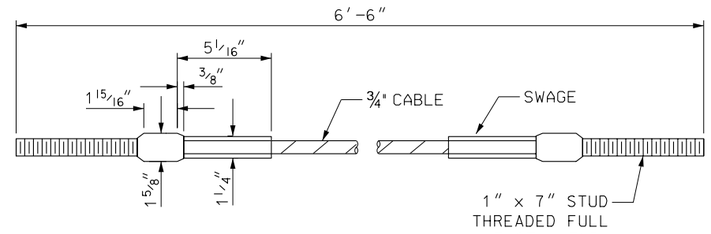
ANCHOR PLATE



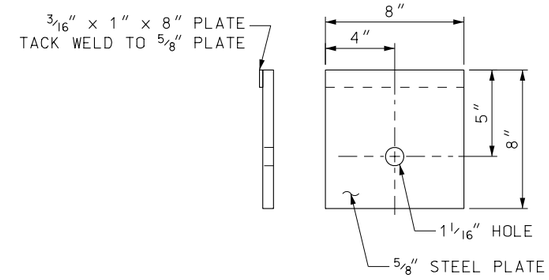
W-BEAM

WOOD BREAKAWAY POST

FOUNDATION TUBE

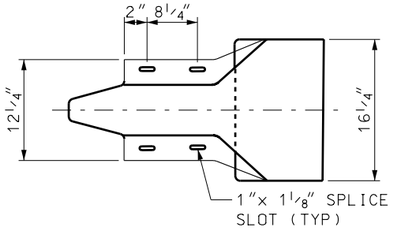


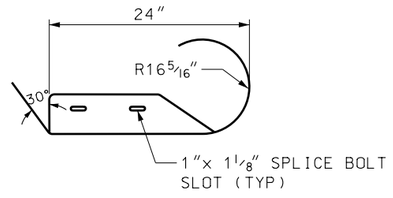
ANCHOR CABLE



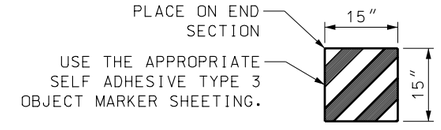
NOTE:
INSTALL BEARING PLATE WITH 5″ PORTION UP. SECURE PLATE TO POST USING TWO NAILS AT TOP OF PLATE.

BEARING PLATE

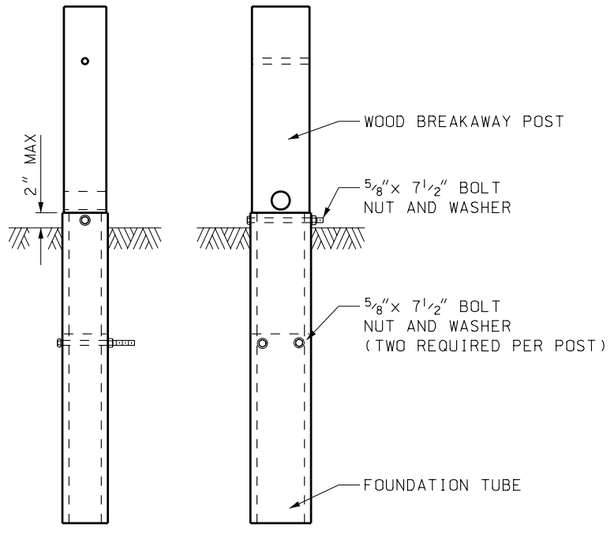




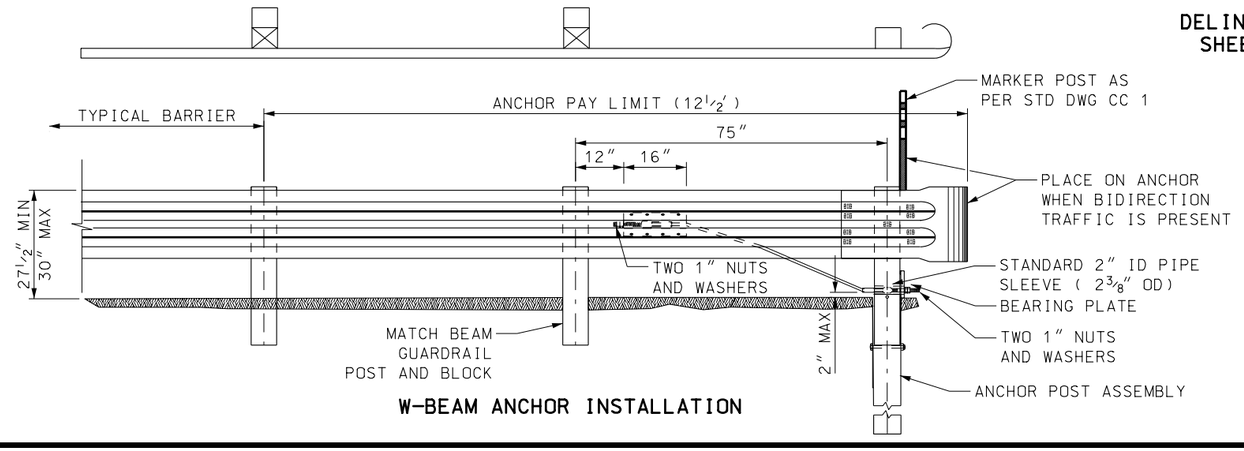
END SECTION (ROUNDED)



DELINEATION SHEETING



ANCHOR POST ASSEMBLY



W-BEAM ANCHOR INSTALLATION

REVISIONS

NO.	DATE	APPR.	REMARKS
1	10/27/05	G.S.	REMOVED SOIL PLATE REQUIREMENT. REVISED W-BEAM ANCHOR INSTALLATION DETAIL. REVISED DIMENSIONS ON BREAKAWAY POST AND FOUNDATION TUBE.
2	10/29/06	G.S.	ADDED DELINEATION MARKER AND POST TO W-BEAM ANCHOR INSTALLATION.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

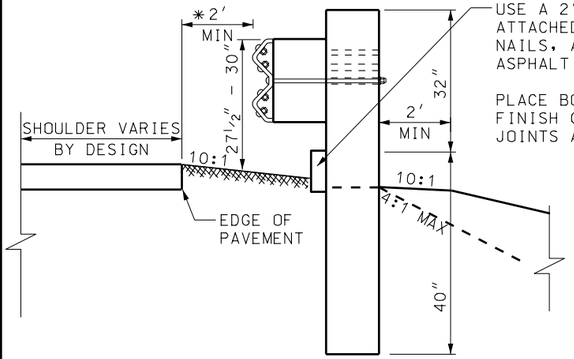
RECOMMENDED FOR APPROVAL — OCT.27.2005 DATE
CHAIRMAN STANDARDS COMMITTEE APPROVED — OCT.27.2005 DATE
DEPUTY DIRECTOR

W-BEAM GUARDRAIL ANCHOR TYPE I

STANDARD DRAWING TITLE

STD DWG
BA 4D

DGN File: L:\Standard_Drawings\Imperial\2005Working\StandardsCommitteeFiles\November06\BA04D.dgn
09-NOV-2006



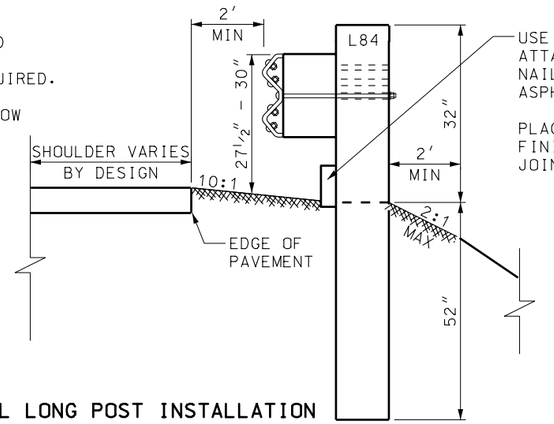
USE A 2″ x 6″ REDWOOD PLANK, ATTACHED WITH 60 D GALVANIZED NAILS, AS AN ALTERNATE TO ASPHALT CONCRETE CURB IF REQUIRED.

PLACE BOTTOM OF PLANK ½″ BELOW FINISH GRADE. POSITION BUTT JOINTS AT CENTER OF POSTS.

INITIAL INSTALLATION

USE 72″ LONG POSTS

* NOTE:
2′ MINIMUM OR PLACE AS FAR OFF PAVEMENT EDGE AS PRACTICAL.



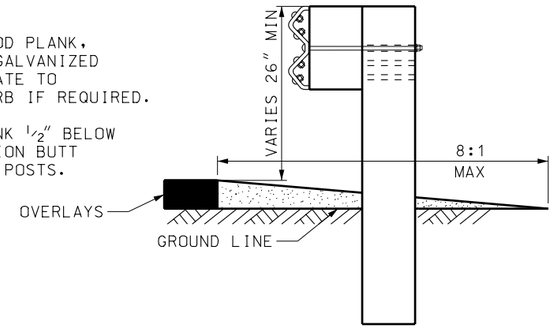
USE A 2″ x 6″ REDWOOD PLANK, ATTACHED WITH 60 D GALVANIZED NAILS, AS AN ALTERNATE TO ASPHALT CONCRETE CURB IF REQUIRED.

PLACE BOTTOM OF PLANK ½″ BELOW FINISH GRADE. POSITION BUTT JOINTS AT CENTER OF POSTS.

INITIAL LONG POST INSTALLATION

USE 84″ LONG POSTS

NOTE:
USE THIS INSTALLATION WHEN THE MINIMUM 2′ DEFLECTION AREA BEHIND RAIL CANNOT BE PROVIDED.



RAIL ELEMENT RAISED

NOTES:

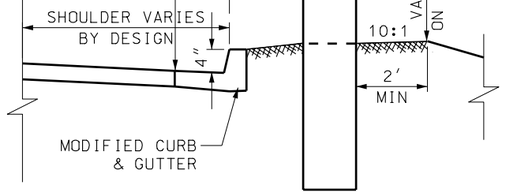
RAISE RAIL ELEMENT WHEN OVERLAY IS REQUIRED.

RAISED RAIL ELEMENT WILL ACCOMMODATE 6″ TO 8″ OF OVERLAY MATERIAL.

SLOPE OF SHOULDER INTO FACE OF RAIL NOT TO EXCEED 8:1.

RAISE REDWOOD PLANKING WHEN REQUIRED.

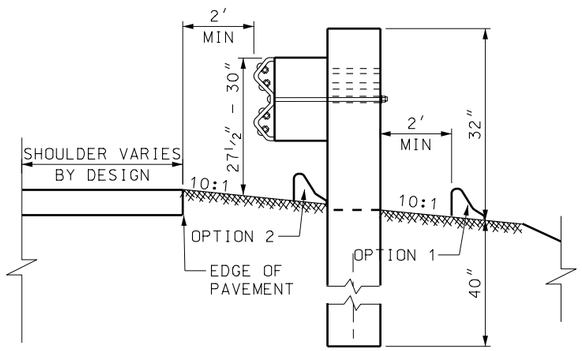
RAISING THE RAIL ELEMENT TO MAXIMUM HEIGHT REQUIRED BEFORE THE MINIMUM HEIGHT OF THE RAIL ELEMENT ABOVE GROUND LEVEL CAN BE REDUCED TO THE MINIMUM OF 25″.



INSTALLATION W/MODIFIED TYPE B1 CURB & GUTTER

USE 72″ LONG POST

SEE STD DWG BA 4Q SERIES FOR SPECIFIC INSTALLATION REQUIREMENTS



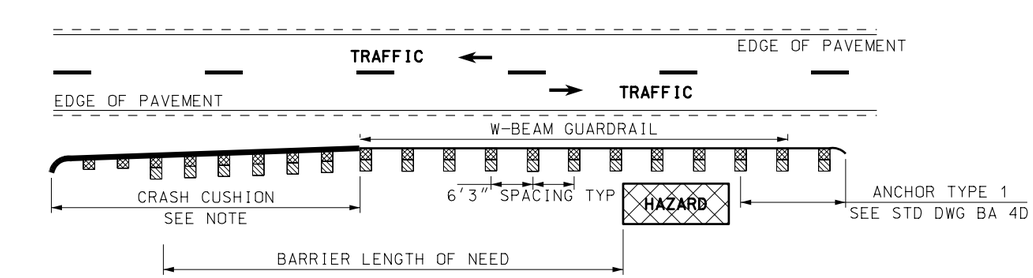
INSTALLATION W/ASPHALT CONCRETE CURB

OPTION 1: PREFERRED INSTALLATION.

OPTION 2: PLACE FACE OF ASPHALT CONCRETE CURB BEHIND FACE OF RAIL. 2″ MAXIMUM CURB HEIGHT WHEN USED IN FRONT OF POST.

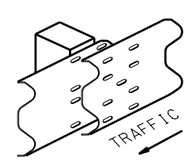
NOTES:
1. DO NOT PLACE BARRIER ON SLOPES STEEPER THAN 6:1
2. MEASURE RAIL HEIGHT FROM SHOULDER LINE OR HINGE POINT EXTENDED. USE BOTTOM BOLT HOLE FOR BLOCK AND RAIL ATTACHMENT.
3. MEASURE RAIL HEIGHT FROM GROUND LINE WHEN BARRIER IS PLACED 12 FEET OR GREATER FROM EDGE OF SHOULDER. USE CENTER BOLT HOLE FOR BLOCK AND RAIL ATTACHMENT.
4. USE 84 INCH POST IF THE 6:1 SLOPE CANNOT BE MAINTAINED 2 FEET BEHIND THE LINE POSTS.

BARRIER INSTALLATION ON 6:1 SLOPE

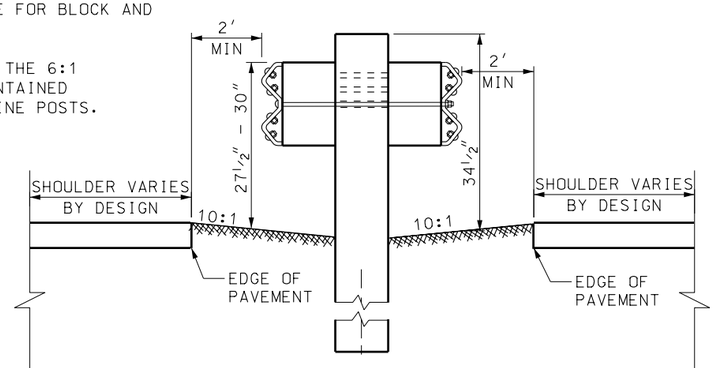


TYPICAL INSTALLATION

NOTE:
CRASH CUSHION REQUIRED WHEN BARRIER END IS WITHIN 1.2 TIMES AASHTO ROADSIDE DESIGN GUIDE CLEAR ZONE.



SPLICE LAP DETAIL



MEDIAN BARRIER

NOTES:
RAISE BOTH RAIL ELEMENTS AS PER RAIL ELEMENT RAISED DETAIL, WHEN REQUIRED.

ATTACH REQUIRED DELINEATION ON THE POST.

REVISIONS

NO.	DATE	APPR.	REMARKS
1	10/29/06	G.S.	ADDED NOTE UNDER CURB AND GUTTER DETAIL. REVISED
			REVISED ASPHALT CONCRETE CURB OPTION 2. REVISED
			BARRIER ON 6:1 SLOPE DETAIL.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

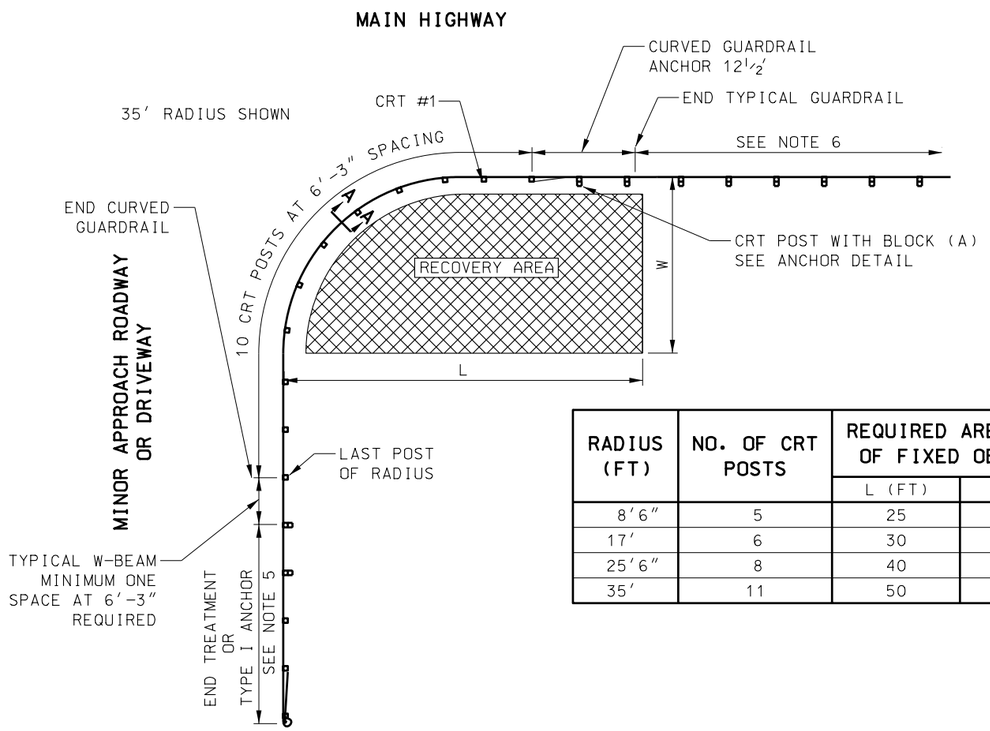
RECOMMENDED FOR APPROVAL — JAN.01.2005 DATE
CHAIRMAN STANDARDS COMMITTEE — JAN.01.2005 DATE
APPROVED
DEPUTY DIRECTOR

W-BEAM GUARDRAIL INSTALLATIONS

STANDARD DRAWING TITLE

STD DWG
BA 4E

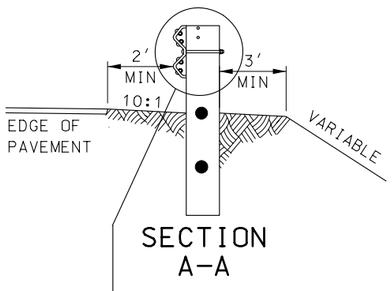
DGN File: L:\Standard Drawings\Imperial\2005Working\StandardsCommittee Files\November 05\ba04e.dgn
09-NOV-2005



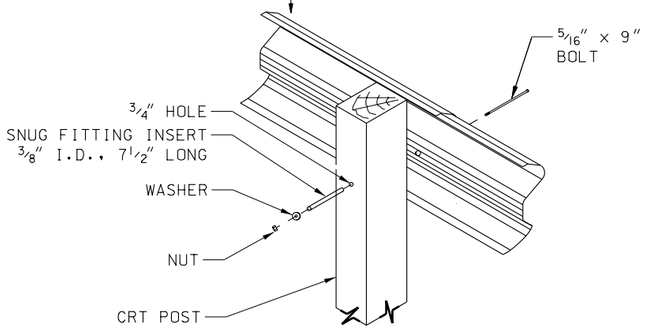
RADIUS (FT)	NO. OF CRT POSTS	REQUIRED AREA FREE OF FIXED OBJECTS	
		L (FT)	W (FT)
8′6″	5	25	15
17′	6	30	15
25′6″	8	40	20
35′	11	50	20

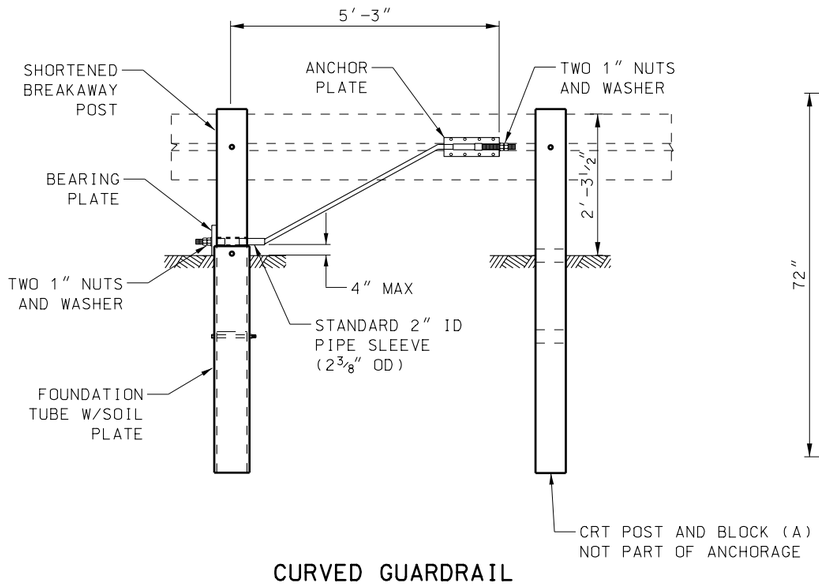
NOTES:

1. LIST RADIUS REQUIREMENT FOR EACH LOCATION IN THE PROJECT PLANS AND SUMMARY SHEET.
2. SHOP BEND RADIUS ELEMENTS. FIELD BENDING IS NOT PERMITTED.
3. RECOVERY AREA BEHIND THE GUARDRAIL TO BE MAINTAINED FREE OF FIXED OBJECTS.
4. MAINTAIN 10:1 SLOPE IN FRONT OF CURVED SECTION.
5. USE END TREATMENTS, TYPE "G" OR "H" ON INTERSECTING ROADWAYS OPEN TO THE GENERAL PUBLIC. USE ANCHOR TYPE I (REFER TO STD DWG BA 4D) ON BUSINESS/RESIDENTIAL DRIVEWAYS, OR RESTRICTED/LIMITED ENTRY ROADWAYS.
6. DO NOT ATTACH DIRECTLY TO W-BEAM GUARDRAIL TRANSITION, BA 4B, INSTALL 12½ FEET OF TYPICAL W-BEAM GUARDRAIL AT END OF TRANSTION PRIOR TO INSTALLING CURVED GUARDRAIL ANCHOR.
7. USE ANCHOR TYPE I WHEN OPPOSING TRAFFIC IS 1.2 TIMES FROM THE REQUIRED CLEAR ZONE.
8. USE NOMINAL DIMENSIONS FOR ALL TIMBER.



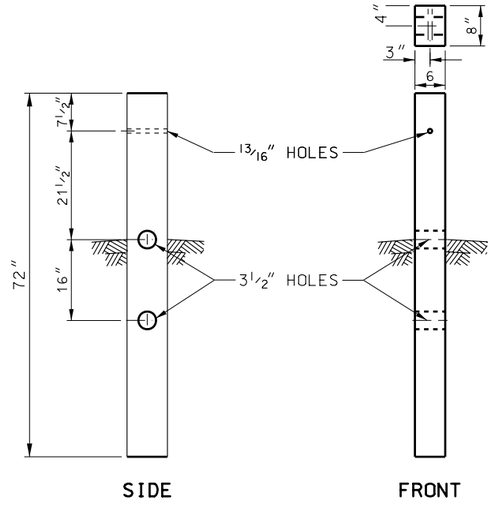
SECTION A–A





CURVED GUARDRAIL ANCHOR

(REFER TO STD DWG BA 4D)



CONTROLLED RELEASE TERMINAL (CRT) POST

SEE NOTE 7

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL — JAN.01.2005 DATE

CHAIRMAN STANDARDS COMMITTEE APPROVED — JAN.01.2005 DATE

DEPUTY DIRECTOR

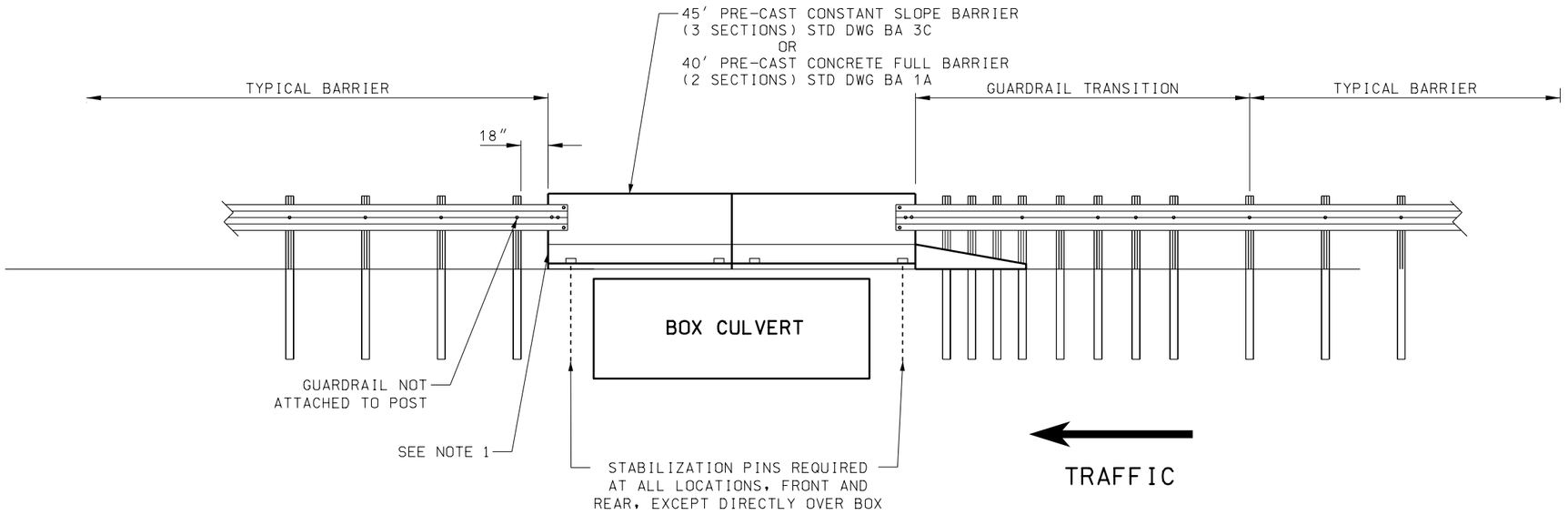
W-BEAM GUARDRAIL CURVE DETAILS

STANDARD DRAWING TITLE

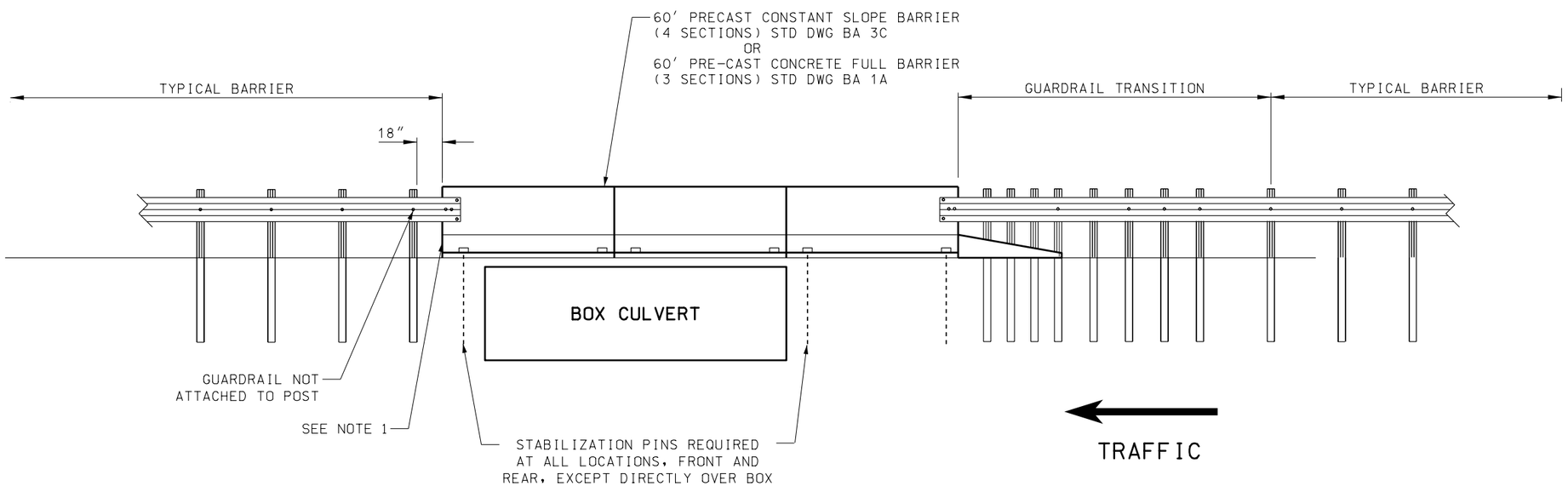
STD DWG
BA 4L

DGN File:L:\Standard Drawings\Imperial\2005Working\Standards Committee Files\November 06\BA04L.dgn

09-NOV-2006



DETAIL A
BOX CULVERT >25′ & ≤30′



DETAIL B
BOX CULVERT >30′

NOTE:

1. INSTALL W-BEAM TRANSITION WHEN TRAFFIC FROM THE OPPOSITE APPROACH IS WITHIN 1.2 CLEAR ZONE REQUIREMENT.

REVISIONS

NO.	DATE	APPR.	REMARKS
1	10/29/06	G.S.	ADDED NOTE 1.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

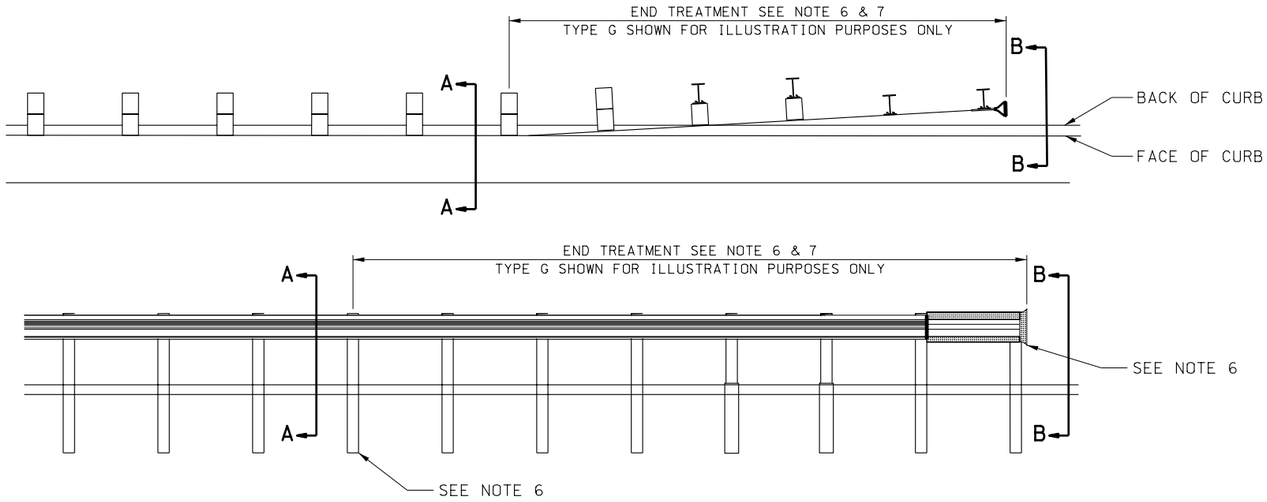
RECOMMENDED FOR APPROVAL — JAN.01.2005 DATE
CHAIRMAN STANDARDS COMMITTEE APPROVED — JAN.01.2005 DATE
DEPUTY DIRECTOR

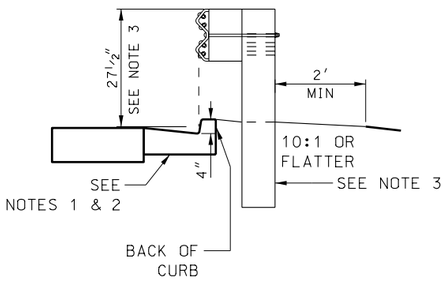
W-BEAM GUARDRAIL
WITH PRECAST BARRIER
FOR SPAN > 25′

STANDARD DRAWING TITLE

STD DWG
BA 4P

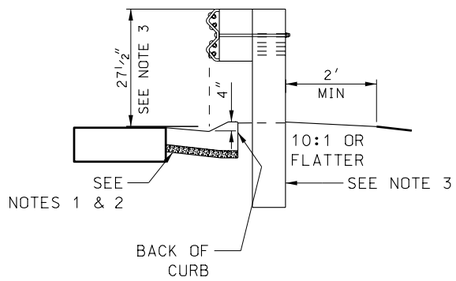
DGN File:L:\Standard Drawings\Imperial\2005Working\StandardsCommitteeFiles\November-06\BA04P.dgn
09-NOV-2006





SECTION A–A

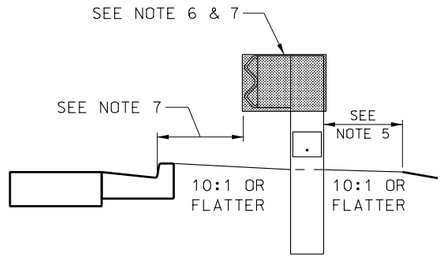
W–BEAM GUARDRAIL
MODIFIED TYPE B1 CURB AND GUTTER



SECTION A–A

W–BEAM GUARDRAIL
TYPE M1 CURB AND GUTTER

TYPE B1 AND TYPE MI SHOWN AS EXAMPLES
4 INCH MAXIMUM HEIGHT FOR ALL CURBS
AND/OR CURB AND GUTTER TYPES



SECTION B–B

NOTES:

1. MEET REQUIREMENTS OF STD DWG GW 2 PRIOR TO INSTALLING CURB AND/OR CURB AND GUTTER WITH W-BEAM GUARDRAIL.
2. MODIFY CURB AND/OR CURB AND GUTTER TO A MAXIMUM OF 4 INCHES AT FACE OF CURB.
3. DRIVE GUARDRAIL POST TO THE DEPTH REQUIRED TO ATTACH BLOCK AND RAIL AT THE TOP HOLE OF THE POST. SET RAIL HEIGHT AT FACE OF CURB FROM TRAVELWAY SURFACE EXTENDED, WHEN RAIL ELEMENT IS AT FACE OF CURB.
4. INSTALL IN A MANNER THAT FACE OF W-BEAM RAIL IS FLUSH WITH FACE OF CURB.
5. CONSTRUCT PAD AS PER APPLICABLE CC STD DWG.
6. ATTACH END TREATMENT AT LAST POST OF TYPICAL RUN. GRADUALLY RAISE END TREATMENT RAIL ELEMENT TO MEET HEIGHT REQUIRED BY THE MANUFACTURER AT END TREATMENT HEAD. THIS APPLIES TO END TREATMENT TYPES "G" AND "H" SYSTEMS.
7. OFFSET END TREATMENT AS PER APPLICABLE CC STD DWG.
   A. TYPE "G" TYPICAL OFFSET 2 FEET.
   B. TYPE "H" TYPICAL OFFSET 4 FEET.

W–BEAM GUARDRAIL& END TREATMENT INSTALLATION WITH MODIFIED CURBS AND/OR CURB AND GUTTER TYPES

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

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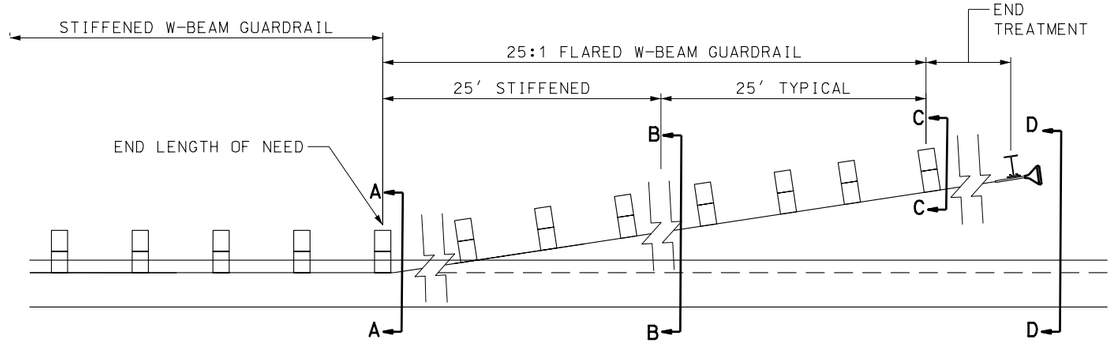
CHAIRMAN STANDARDS COMMITTEE APPROVED — JAN.01.2005 DATE
DEPUTY DIRECTOR

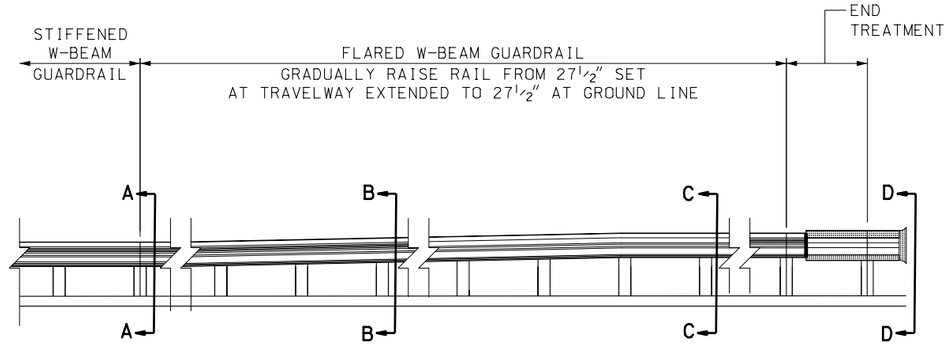
W-BEAM GUARDRAIL
WITH MODIFIED
CURB AND/OR
CURB AND GUTTER

STANDARD DRAWING TITLE

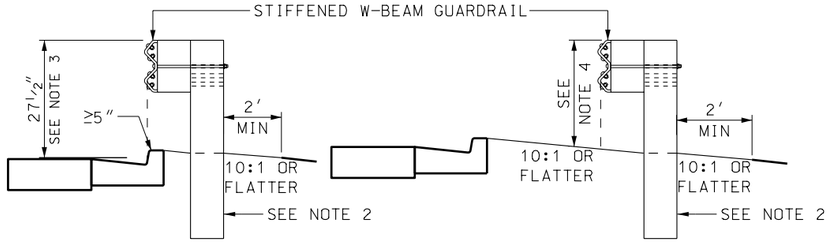
STD DWG
BA 4Q1



PLAN
SEE NOTE 1

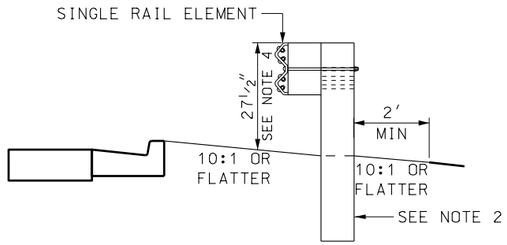


ELEVATION
SEE NOTE 1

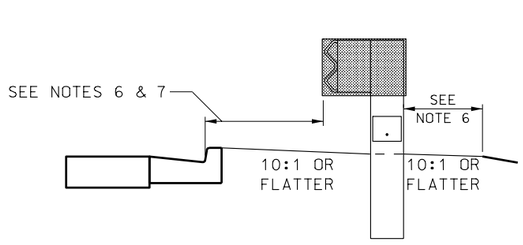


SECTION A-A

SECTION B-B



SECTION C-C



SECTION D-D

TYPE B1 CURB AND GUTTER SHOWN AS EXAMPLE
APPLIES TO ALL CURBS AND/OR CURB AND GUTTER TYPES
SEE NOTE 1

STIFFENING METHODS

NESTED W-BEAM

BACK SIDE RAIL ATTACHMENT

NOTES:

1. USE STIFFENED W-BEAM GUARDRAIL WHEN DESIGN SPEED IS 50 MPH OR GREATER.
2. DRIVE GUARDRAIL POST TO THE DEPTH REQUIRED TO ATTACH BLOCK AND RAIL AT THE TOP HOLE OF THE POST FOR COMPLETE GUARDRAIL RUN.
3. SET RAIL HEIGHT AT FACE OF CURB FROM TRAVELWAY SURFACE EXTENDED, WHEN RAIL IS AT FACE OF CURB.
4. GRADUALLY RAISE RAIL ELEMENT OVER THE LENGTH OF FLARED BARRIER TO ATTACH END TREATMENT AT REQUIRED HEIGHT.
5. ADDITIONAL STIFFENING OF W-BEAM GUARDRAIL TRANSTION, BA 4B, NOT REQUIRED WHEN INSTALLED WITH CURB AND/OR CURB AND GUTTER.
6. CONSTRUCT PAD AS PER APPLICABLE CC STD DWG.
7. OFFSET END TREATMENT AS PER APPLICABLE CC STD DWG.
   A. TYPE "G": PLACE ALONG 25:1 FLARE LINE.
   B. TYPE "H": PLACE WITH 4 FOOT OFFSET FROM 25:1 FLARE LINE.

W-BEAM GUARDRAIL & END TREATMENT INSTALLATION WITH CURB & GUTTER 5" OR GREATER

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — JAN.01.2005 DATE — DEPUTY DIRECTOR
CHAIRMAN STANDARDS COMMITTEE APPROVED — JAN.01.2005 DATE

W-BEAM GUARDRAIL WITH CURB AND GUTTER ≥5"

STANDARD DRAWING TITLE

STD DWG
BA 4Q2

DGN File:L:\Standard Drawings\Imperial\2005Working\StandardsCommitteeFiles\November06\BA04Q2.dgn
09-NOV-2006

Standards Committee Submittal Sheet

Name of preparer: Glenn Schulte
Title/Position of preparer: Transportation Safety Specialist/Inspector II
Specification/Drawing/Item Title: Guardrail Barrier End Treatments
Specification/Drawing Number: CC 8A, CC 8B, CC 9A

Enter appropriate priority level:
(See last page for explanation) **3**

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:
1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web. (http://www.udot.utah.gov/index.php/m=c/tid=303)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

These systems are changing due to maintenance issue in the field. The current systems are an all-wood post system. This change will make the systems steel and wood post systems. This change is being recommended for the following reasons:

1. Post #1 carriers the head of the system, which weighs up to 205 lbs., over time this post splits and allows the head to fall down, being lower than intended for an impacting vehicle.
    a. Using a steel post will keep the head in proper orientation.
    b. Posts 1 & 2, will be hinged, in some impact situation will be reusable.
2. Repair history shows that most impacts take posts 1 through 4. The wood post again over time, swell in the foundation tubes and are difficult to repair.
    a. Posts 3 & 4 will use a shortened steel breakaway post inside a foundation tube.
3. Standard CRT through out the rest of the systems.

All existing systems can be retro fitted to a steel post system when repair work is required. A letter of instruction has been developed for maintenance to perform this retro fit.

A new repair contract, going out to bid, requires the steel post option during repairs.

B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No bid item required

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at http://www.udot.utah.gov/index.php/m=c/tid=659 for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

No comments as of 11-6-2006

ACEC Comments: (Use as much space as necessary.)

No comments as of 11-6-2006

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers

Region 4: Clark MacKay reviewed and made comments, corrections and concerns addressed.

Contractors (Any additional contacts beyond “C” above.)

No comments as of 11-6-2006

Suppliers
No comments as of 11-6-2006

Consultants (as required) (Any additional contacts beyond "C" above.)
No comments as of 11-6-2006

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)
No comments as of 11-6-2006

Others (as appropriate)

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

Estimates from the 2 manufacturers states the steel post option will increase initial cost about $250 to $300.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

Will help maintenance from replacing post 1 when no impacts have occurred.
Easier repair after an incident.

3. Life cycle cost.

Will decrease the life cycle cost for maintenance, a post will not have to be changed out due to environmental issues.

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

These changes will benefit the department by not having to replace the wood posts because of a weathering factor, or incidental contacts such as heavy snow hitting the heads. If proper maintenance is occurring some post may have been changed 2 or 3 times in a heavy snow season.

Cost of a shortened wood post $30 to $45.
Cost of a steel hinge breakaway breakaway post
Hinge breakaway post required on two systems.
Full replacement cost: $105 (should very seldom occur)
Top section only: $ 28.00 (replacement may nor be required except under very sever impact conditions.)
If bolt replacement only $2.00

Cost of a plug welded post or steels yielding post $ 35 to $50
These types of posts are used 3 of the 4 approved systems.

H. Safety Impacts?

Will keep the head in the proper position for an impact.

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

You can drive through out the roadway system and see these systems with hanging heads. A total number of repairs done and/or systems that need repair has not been attained.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

CRASH CUSHION TYPE G

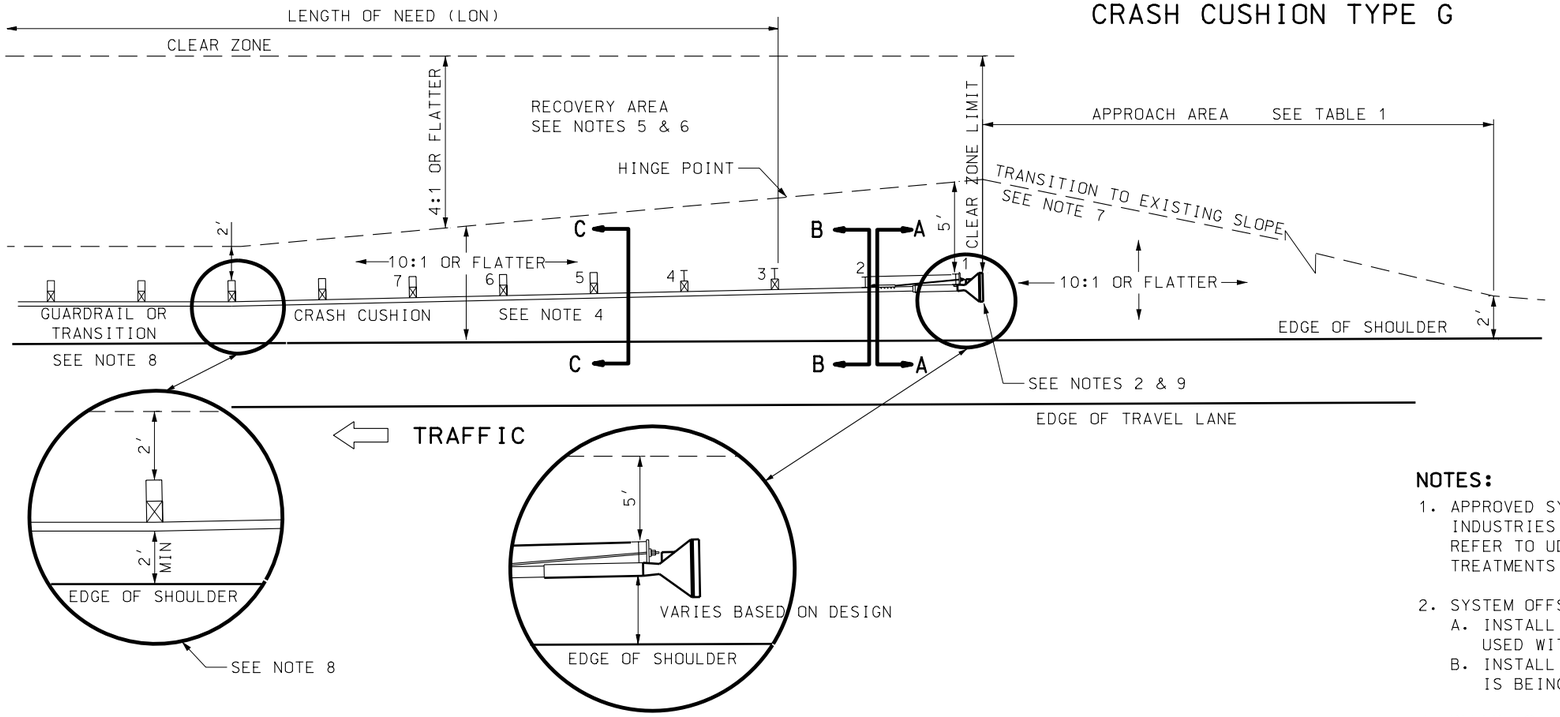


TABLE 1	
SPEED MPH	TAPER
LESS THAN 40	7:1
40 TO 55	10:1
60 TO 75	15:1

NOTES:

1. APPROVED SYSTEMS: ET-2000 AND ET-PLUS MANUFACTURED BY TRINITY INDUSTRIES AND THE SKT-350, MANUFACTURED BY ROAD SYSTEMS INC. REFER TO UDOT'S GUIDELINES FOR CRASH CUSHIONS AND END TREATMENTS FOR SPECIFIC SYSTEM DETAILS.

2. SYSTEM OFFSET:
   A. INSTALL SYSTEM WITH 2 FOOT OFFSET (25:1 FLARE RATE) WHEN USED WITH A TANGENT BARRIER SYSTEM.
   B. INSTALL SYSTEM AT THE SAME FLARE RATE AS THE BARRIER IT IS BEING ATTACHED TO.

3. REFER TO UDOT'S GUIDELINES FOR CRASH CUSHION AND END TREATMENTS FOR POST REQUIREMENTS.
   A. POST 1
      1) ET SERIES-HINGE BREAKAWAY POST (HBA)
      2) SKT-350 PLUG WELDED POST INSIDE FOUNDATION TUBE

4. RAIL ELEMENTS
   A. USE 12½ FOOT RAIL ELEMENTS AS SPECIFIED BY THE SYSTEM MANUFACTURER.
   B. DO NOT BOLT RAIL ELEMENT AT POST 1.
   C. REFER TO MANUFACTURE SPECIFICATIONS FOR OTHER RAIL TO POST BOLT REQUIREMENTS.

5. COMPLETE SLOPE PREPARATION PRIOR TO INSTALLING SYSTEM.
   A. USE 10:1 OR FLATTER SLOPES IN APPROACH AREA.
   B. USE 4:1 OR FLATTER FORESLOPE OR BACKSLOPE IN THE RECOVERY AREA.
      1) IF A 4:1 FORESLOPE IN RECOVERY AREA IS IMPRACTICAL USE A MAXIMUM 3:1 FORESLOPE. ESTABLISH A RECOVERY AREA AT THE TOE OF THE 3:1 FORESLOPE OF 4:1 OR FLATTER.
   C. USE A 4:1 BACKSLOPE TO THE CLEAR ZONE LIMIT IN THE RECOVERY AREA. IF A 4:1 BACKSLOPE CANNOT BE ESTABLISHED A 3:1 BACKSLOPE IS PERMITTED.

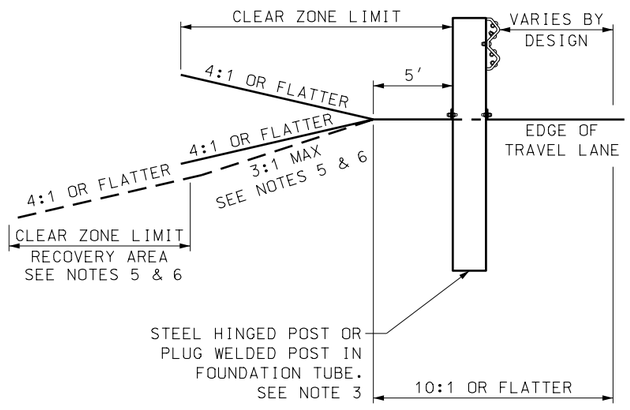
6. CLEAR RECOVERY AND APPROACH AREAS OF ANY FIXED OBJECTS.
   A. DO NOT PLACE SIGNS OR POLES IN APPROACH AREA.
   B. USE BREAKAWAY SIGNS OR POLES WHEN PLACED IN RECOVERY AREA, AND MAINTAIN A MINIMUM 10 FOOT CLEARANCE TO THE SIDES AND REAR OF THE SYSTEM.

7. CONSTRUCT PLATFORM AS REQUIRED WHEN THE SPACE IS AVAILABLE EVEN IF THE PLATFORM EXTENDS BEYOND THE CLEAR ZONE REQUIREMENTS. SEE STD DWG CC8B FOR EXCEPTIONS.

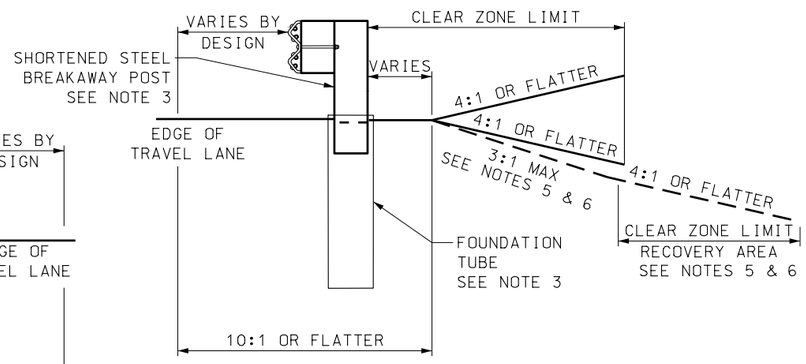
8. USE GUARDRAIL TRANSITION, STD DWG BA 4 SERIES, WHEN ATTACHING SYSTEM TO CONCRETE BARRIER OR BRIDGE PARAPET.

9. INSTALL REQUIRED MARKINGS AS PER STD DWG CC 1.

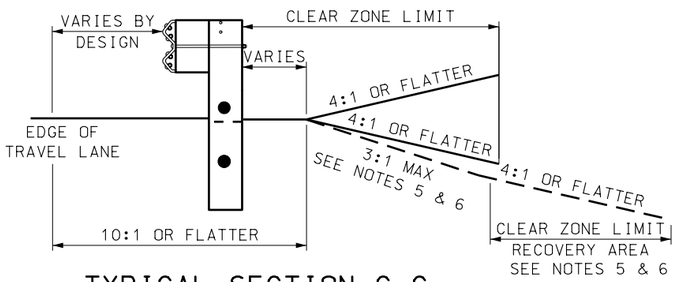
10. USE THE CURRENT EDITION, ROADSIDE DESIGN GUIDE TO ESTABLISH CLEAR ZONE REQUIREMENT AND LENGTH OF NEED (LON) REQUIREMENTS.



TYPICAL SECTION A-A
POST 1
SEE NOTE 3



TYPICAL SECTION B-B
POSTS 2-4



TYPICAL SECTION C-C
POSTS 5-8
SEE NOTE 3

REVISIONS

NO.	DATE	APPR.	REMARKS
1	02/24/05	GS	MODIFIED RECOVERY AREA REQUIREMENTS, REVISED NOTES AND TABLE 1.
2	04/28/05	GS	REISSUED TO CORRECT OVERSIGHT.
3	10/26/06	GS	REVISED TO REFLECT STEEL POST REQUIREMENTS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL — APR.28,2005 DATE
CHAIRMAN STANDARDS COMMITTEE APPROVED — APR.28,2005 DATE
DEPUTY DIRECTOR

GRADING AND INSTALLATION DETAILS CRASH CUSHION TYPE G

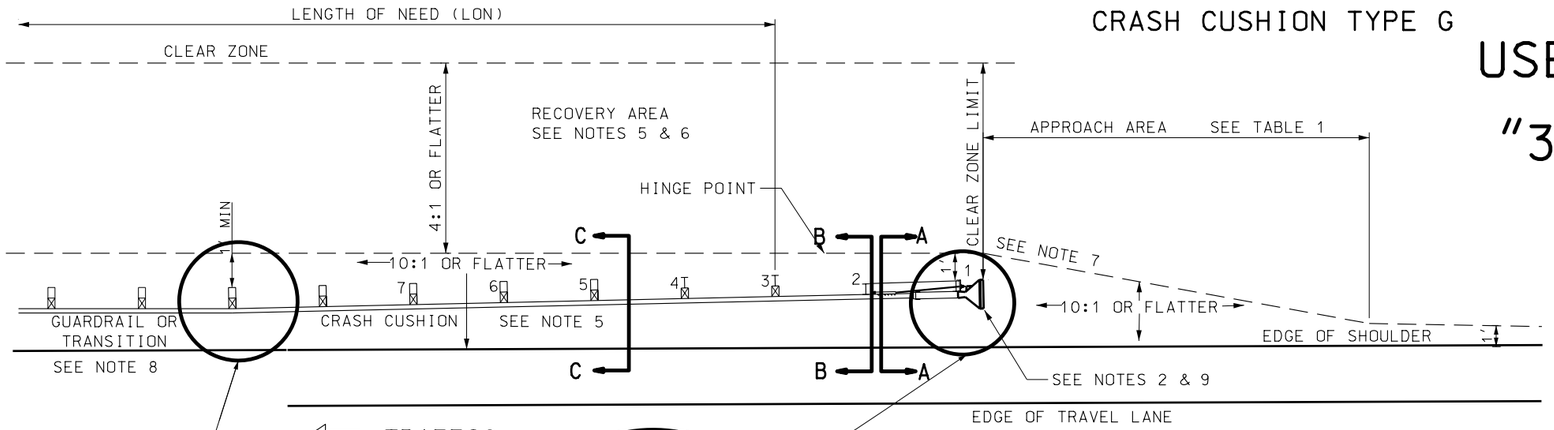
STANDARD DRAWING TITLE

STD DWG
CC 8A

DGN File:L:\Standard Drawings\Imperial\2005\Working\Standards Committee Files\November-06\CC08A.dgn
09-NOV-2006

CRASH CUSHION TYPE G

USE THIS DETAIL FOR "3R" PROJECTS ONLY



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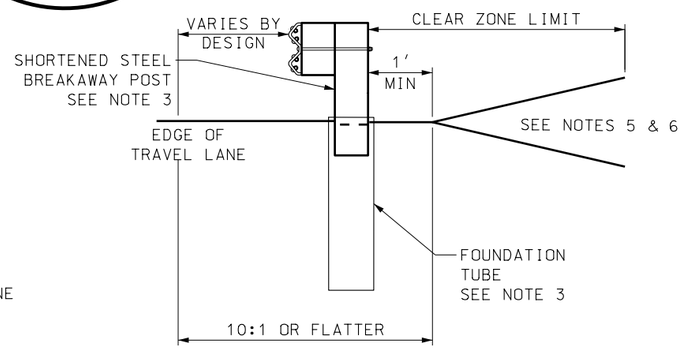
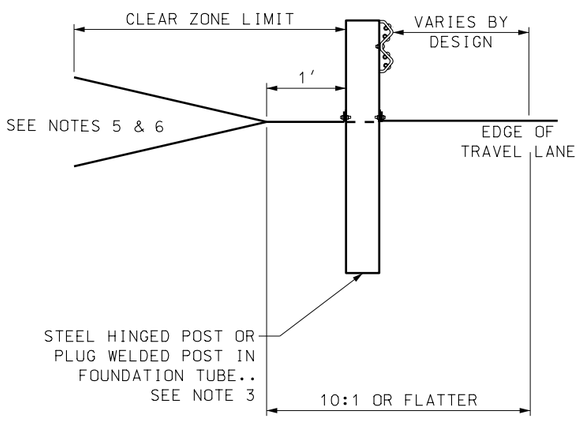
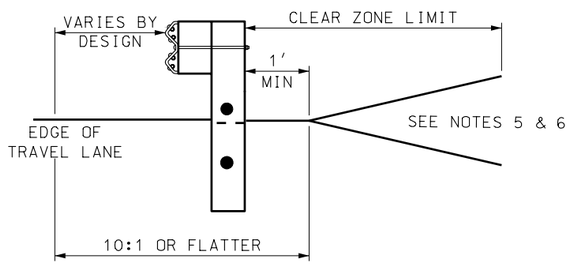
SPEED MPH	TAPER
LESS THAN 40	7:1
40 TO 55	10:1
60 TO 75	15:1



TYPICAL SECTION B–B
POSTS 2–4



TYPICAL SECTION A–A
POST 1
SEE NOTE 3



TYPICAL SECTION C–C
POSTS 5–8
SEE NOTE 3

NOTES:

1. APPROVED SYSTEMS: ET-2000 AND ET-PLUS MANUFACTURED BY TRINITY INDUSTRIES AND THE SKT-350, MANUFACTURED BY ROAD SYSTEMS INC. REFER TO UDOT'S GUIDELINES FOR CRASH CUSHIONS AND END TREATMENTS FOR SPECIFIC SYSTEM DETAILS.

2. SYSTEM OFFSET:
   A. INSTALL SYSTEM WITH 2 FOOT OFFSET (25:1 FLARE RATE) WHEN USED WITH A TANGENT BARRIER SYSTEM.
   B. INSTALL SYSTEM AT THE SAME FLARE RATE AS THE BARRIER INSTALLATION SYSTEM IS BEING ATTACHED TO.

3. POST OPTIONS: REFER TO UDOT'S GUIDELINES FOR CRASH CUSHION FOR APPROVED POST OPTIONS.
   A. POST 1
      1) ET SERIES-HINGE BREAKAWAY POST (HBA)
      2) SKT-350 PLUG WELDED POST INSIDE FOUNDATION TUBE.

4. RAIL ELEMENTS
   A. USE 12½ FOOT RAIL ELEMENTS AS SPECIFIED BY THE SYSTEM MANUFACTURER.
   B. DO NOT BOLT RAIL ELEMENT TO POST 1.
   C. REFER TO MANUFACTURE SPECIFICATIONS FOR OTHER RAIL TO POST BOLT REQUIREMENTS.

5. COMPLETE SLOPE PREPARATIONS PRIOR TO INSTALLING SYSTEM.
   A. USE 10:1 OR FLATTER SLOPES IN APPROACH AREAS.
   B. CONSTRUCT RECOVER AREA SLOPE AS PER CC8A WHEN CONDITIONS PERMIT. CONSULT ENGINEER FOR ALLOWABLE SLOPES WHEN SLOPE REQUIREMENTS OF CC 8A CANNOT BE MET.

6. CLEAR RECOVERY AND APPROACH AREAS OF ANY FIXED OBJECTS.
   A. DO NOT PLACE SIGNS OR POLES IN APPROACH AREA.
   B. USE BREAKAWAY SIGNS OR POLES WHEN PLACED IN RECOVERY AREA, AND MAINTAIN A MINIMUM 10 FOOT CLEARANCE TO THE SIDES AND REAR OF THE SYSTEM.

7. CONSTRUCT PLATFORM AS REQUIRED EVEN IF THE PLATFORM EXTENDS BEYOND THE CLEAR ZONE REQUIREMENT.

8. USE GUARDRAIL TRANSITION, STD DWG BA 4 SERIES, WHEN ATTACHING SYSTEM TO CONCRETE BARRIER OR BRIDGE PARAPET.

9. INSTALL REQUIRED MARKINGS AS PER STD DWG CC 1.

10. USE THE CURRENT EDITION, ROADSIDE DESIGN GUIDE TO ESTABLISH CLEAR ZONE REQUIREMENT AND LENGTH OF NEED (LON) REQUIREMENTS.

REVISIONS

NO.	DATE	APPR.	REMARKS
1	02/24/05	GS	NEW DRAWING.
2	04/28/05	GS	REISSUED TO CORRECT OVERSIGHT.
3	10/26/06	GS	REVISED TO REFLECT STEEL POST REQUIREMENTS

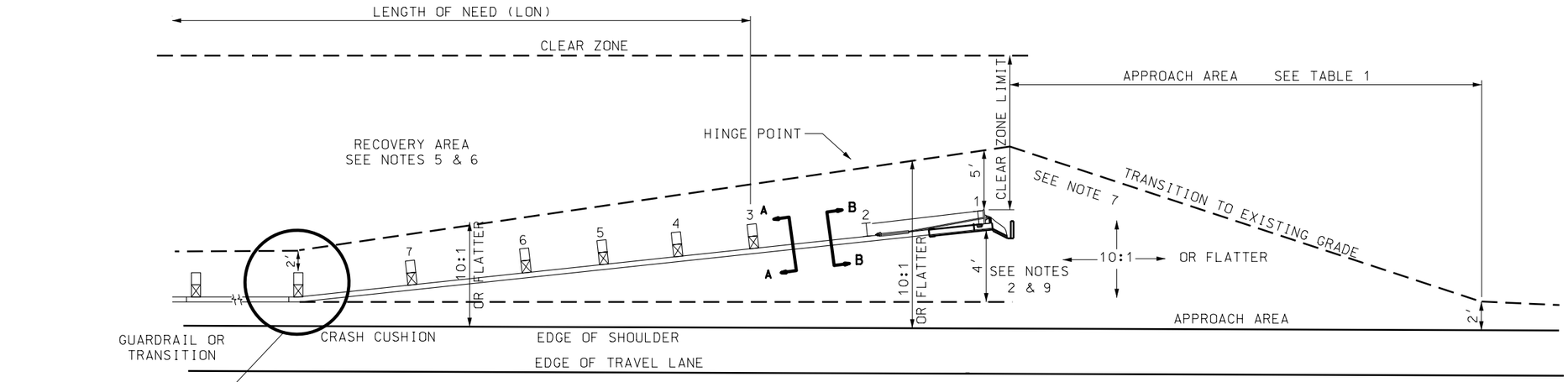
UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL — APR.28.2005 DATE
CHAIRMAN STANDARDS COMMITTEE APPROVED — APR.28.2005 DATE
DEPUTY DIRECTOR

GRADING AND INSTALLATION DETAILS FOR "3R" PROJECTS CRASH CUSHION TYPE G

STANDARD DRAWING TITLE

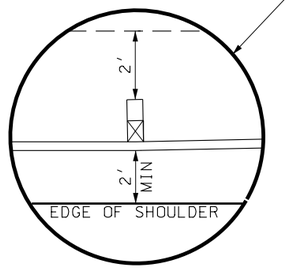
STD DWG
CC 8B

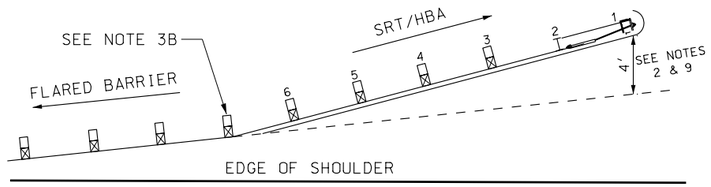


FLEAT - 350 / SRT/HBA

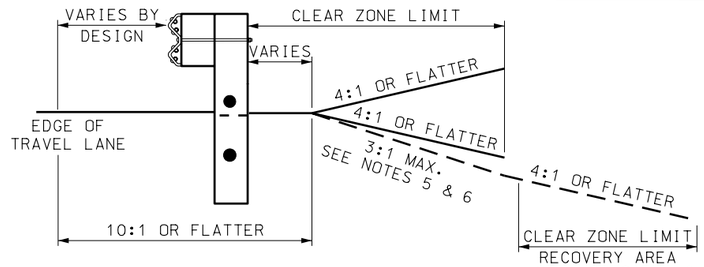
WOOD/STEEL POST
SEE NOTES 2, 3 & 8

SEE NOTES 2, 3 & 8

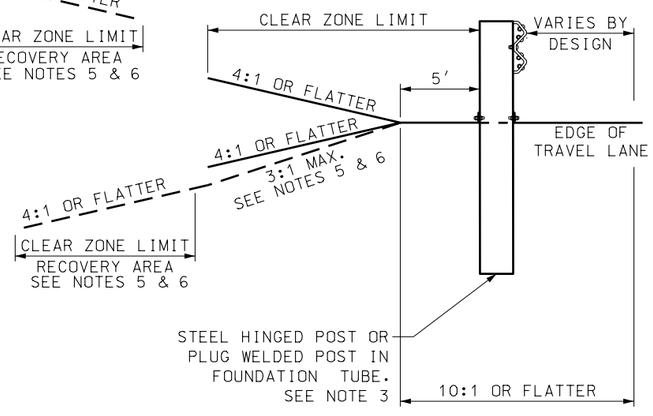




SRT/HBA
WITH FLARED BARRIER
SEE NOTE 2 C



TYPICAL SECTION A-A
POSTS 3-8



TYPICAL SECTION B-B
POSTS 1-2
SEE NOTE 3

TABLE 1	
SPEED MPH	TAPER
LESS THAN 40	7:1
40 TO 55	10:1
60 TO 75	15:1

NOTES:

1. APPROVED SYSTEMS: FLEAT 350, MANUFACTURED BY ROAD SYSTEMS, INC. AND SRT/HBA MANUFACTURED BY TRINITY INDUSTRIES REFER TO UDOT'S GUIDELINES FOR CRASH CUSHIONS AND END TREATMENTS FOR SPECIFIC SYSTEM DETAILS.

2. SYSTEM OFFSET:
   A. INSTALL SYSTEM WITH A 4 FOOT OFFSET WHEN USED WITH A TANGENT BARRIER SYSTEM.
   B. FLEAT-350: INSTALL AT THE SAME FLARE RATE AS THE BARRIER INSTALLATION.
   C. SRT/HBA: INSTALL SYSTEM WITH A 4 FOOT OFFSET, FROM THE FLARED BARRIER EXTENDED.

3. POST OPTIONS: REFER TO UDOT'S GUIDELINES FOR CRASH CUSHIONS FOR APPROVED POST OPTIONS.
   A. POSTS 1 AND 2
      1) FLEAT-350 PLUG WELDED POSTS SET INSIDE 6' FOUNDATION TUBES.
      2) SRT/HBA HINGE BREAKAWAY POSTS.
   B. SRT/HBA: THE LAST POST OF THE GUARDRAIL INSTALLATION OR THE GUARDRAIL TRANSITION ELEMENT (POST #11) WILL BE SUBSTITUTED WITH A CRT POST AS PER MANUFACTURER'S REQUIREMENTS.

4. USE 12 1/2 FOOT RAIL SECTIONS (3 EACH SECTIONS), SLOTTED AS PER MANUFACTURER;S REQUIREMENTS.

5. COMPLETE SLOPE PREPARATION PRIOR TO INSTALLING SYSTEM.
   A. USE 10:1 OR FLATTER SLOPES IN APPROACH AREA.
   B. USE 4:1 OR FLATTER FORESLOPE OR BACKSLOPE IN THE RECOVERY AREA.
      1) IF A 4:1 FORESLOPE IN RECOVERY AREA IS IMPRACTICAL USE A MAXIMUM 3:1 FORESLOPE. ESTABLISH A RECOVERY AREA AT THE TOE OF THE 3:1 FORESLOPE OF 4:1 OR FLATTER.
   C. USE A 4:1 BACKSLOPE TO THE CLEAR ZONE LIMIT IN THE RECOVERY AREA IF A 4:1 CANNOT BE ESTABLISHED A 3:1 IS PERMITTED.

6. CLEAR RECOVERY AND APPROACH AREAS OF ANY FIXED OBJECTS.
   A. DO NOT PLACE SIGNS OR POLES IN APPROACH AREA.
   B. USE BREAKAWAY SIGNS OR POLES WHEN PLACED IN RECOVERY AREA, AND MAINTAIN A MINIMUM 10 FOOT CLEARANCE TO THE SIDES AND REAR OF SYSTEM.

7. CONSTRUCT PLATFORM AS REQUIRED EVEN IF THE PLATFORM EXTENDS BEYOND THE CLEAR ZONE REQUIREMENTS.

8. USE GUARDRAIL TRANSITION, STD DWG BA 4 SERIES, WHEN ATTACHING THE SYSTEM TO CONCRETE BARRIER OR BRIDGE PARAPET.
   A. SRT/HBA: REPLACE THE LAST POST OF THE TRANSITION WITH A CRT POST. SEE NOTE 3.

9. INSTALL REQUIRED MARKINGS AS PER STD DWG CC 1.
10. USE THE CURRENT ROADSIDE DESIGN GUIDE TO ESTABLISH CLEAR ZONE REQUIREMENT AND LENGTH OF NEED (LON) REQUIREMENTS.

NO.	DATE	APPR.	REVISIONS
1	02/24/05	GS	MODIFIED RECOVERY AREA REQUIREMENTS. REVISED NOTES AND TABLE 1. ADDED SRT/HBA FLARED BARRIER DETAIL.
2	04/28/05	GS	REISSUED TO CORRECT OVERSIGHT.
3	10/26/06	GS	REVISED TO REFLECT STEEL POST REQUIREMENTS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — APR.28.2005 DATE
CHAIRMAN STANDARDS COMMITTEE APPROVED — APR.28.2005 DATE
DEPUTY DIRECTOR

GRADING AND INSTALLATION DETAILS CRASH CUSHION TYPE H

STANDARD DRAWING TITLE

STD DWG
CC 9A

DGN File:L:\Standard Drawings\Imperial\2005Working\Standards Committee Files\November 06\CC09a.dgn
09-NOV-2006

Action Item Update for November 30, 2006 Standards Committee Meeting
(As of November 9, 2006)

Item 1, Rumble Strips: Item is past due. Policy already published. No coordination by the Standards Committee. No other information received. Should this item be closed.

Item 2, New Drawing of Three-legged and Four-Legged Intersection: Item was past due from Traffic and Safety. No information received in response to request from Traffic and Safety. The Standards Section was to put a drawing together for the October 2006 meeting. Not complete. Waiting for more information from Traffic and Safety. Should this item be closed.

Item 3, Supplemental Specification 00555M, Prosecution and Progress, Limits of Operation: Due date changed to open. No target date. No new information received. Should this item be closed.

Item 4, Review of Standard Sheets 1B and 1C, Index. Decision was that the sheets are no longer needed. A listing of all Standard Drawings with approval date to be included in all Project Table of Contents files. A hard copy book will be published for with all Standard Drawings and an effective date set. From that point all drawing changes will be treated the same as Supplemental Specification updates. Still in progress. Suggest new target date of Februray 2007.

Item 5, Check Supplemental Specification 02896M: Based on comments at the last meeting by Mont. Checked the files and with James Baird. No open issues. Closed.

Item 6, Supplemental Specification 02844, Concrete Barrier and Standard Drawing BA 3C, Precast Constant Slope Barrier: On agenda for approval.

Item 7, Supplemental Specification 02765, Pavement Marking Paint: Due for the current meeting but no files received. Request for information indicated Tim was checking but not further information was received. Removed from agenda.

End of Agenda Package